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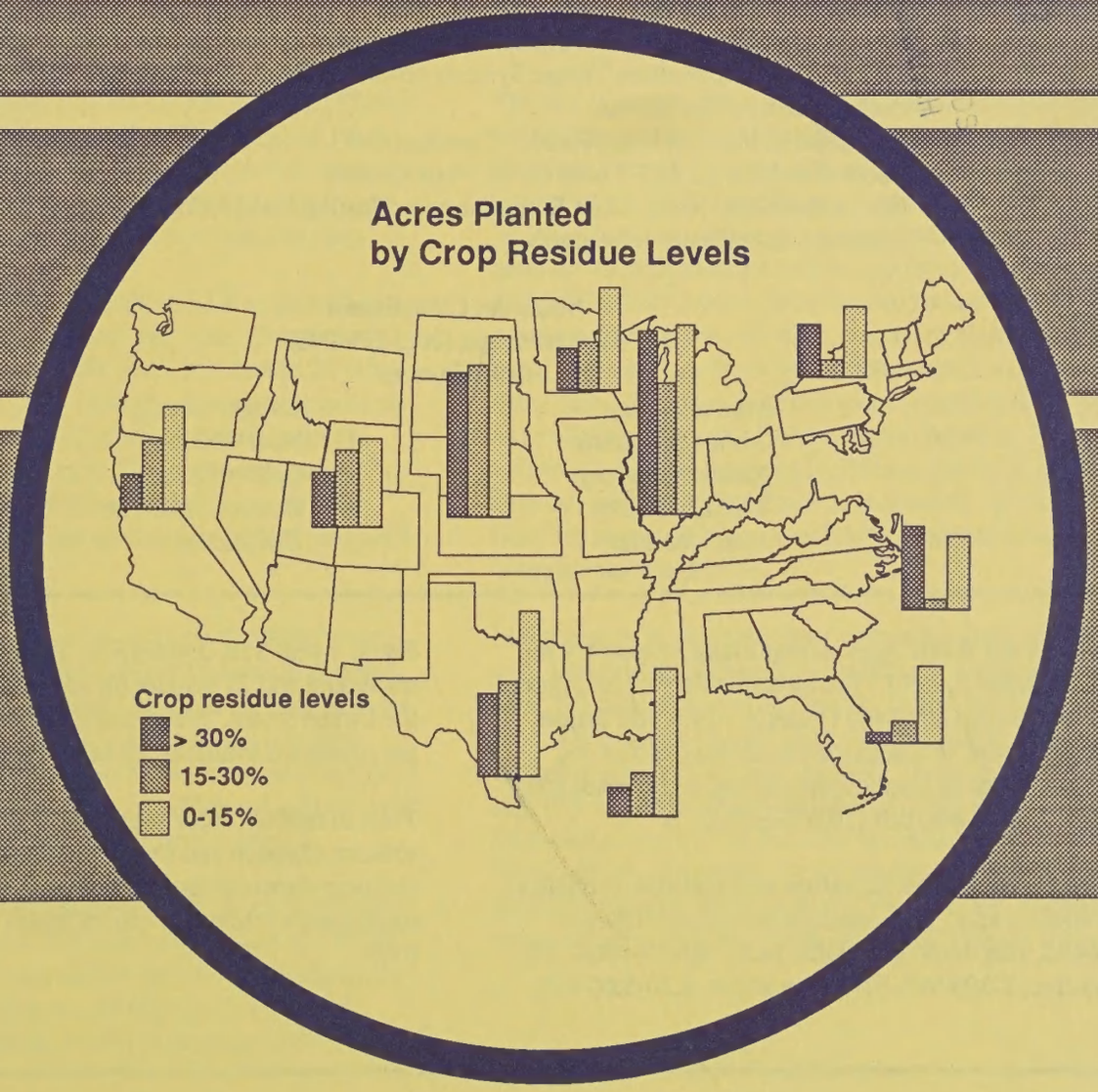
Situation and Outlook Report



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Summary

Cropland used for crops is up from 1991 as land previously idled under Federal programs is returned to production. Federal commodity program participation remained high with lower set-aside requirements for most program crops and new flexibility provisions. Acreage in the Conservation Reserve Program expanded, while additional acreage has been offered under a new Wetland Reserve Program. Due to drought, short irrigation water supplies continued in much of the West while soil moisture was generally favorable elsewhere.

The 343 million cropland acres expected to be used for crops is up 6 million from last year, but down 44 million from the 1981 peak when no land was idled in Federal programs. Cropland acres were up except for the Southeast and Mountain regions. Largest increases occurred in the Southern Plains due to increased planting of wheat, sorghum, and soybeans. Cropland in the Corn Belt was up 1.5 million acres as expanded acreage in feed grains offset a decline in wheat and soybean acreage.

Crop failure is estimated at 8 million acres for 1992--about 1 million acres above the 10 year average. Higher failure rates are expected in the Corn Belt, Northern and Southern Plains, and Mountain regions. More than 2 million acres of Texas cotton were abandoned early this spring due to wet weather and disease problems. Much of the abandoned cotton acreage, however, was replanted to sorghum or another crop.

Based on preliminary enrollment, about 53.7 million acres were idled under Federal programs this year. This is down about 11 million acres from 1991 and down nearly 24 million from the 1988 peak of 78 million. Annual programs account for approximately one-third of idled acres with the balance enrolled in the long-term Conservation Reserve Program (CRP). In 1992, an additional 1 million acres were idled under CRP while land set aside under annual programs declined 12 million acres.

Farmers continued to use the new planting flexibility provision, first offered in 1991, which allows farmers to produce alternative crops and still maintain their full acreage base for participation in future programs. Of the 41 million base acres that could have been planted to another crop this year, producers flexed 8.3 million acres, of which 5.9 million were planted to soybeans and other nonprogram crops.

Although there are surface water shortages in the West, preliminary estimates suggest that total irrigated acreage in the U.S. is increasing. Irrigated land in farms is estimated to be up about 600,000 acres to a record high of 52.1 million. While acreage has increased, average water application rates have been steadily declining with more efficient irrigation systems, shifts to less water-intensive crops, and expansion of irrigated acreage in northern and eastern regions where less water is required.

The Conservation Reserve Program, now in its seventh year, has converted 35.4 million cropland acres to conservation uses. An additional 1.1 million acres have been tentatively accepted for retirement in 1993. As a consequence of a new bid acceptance process, increased enrollments have occurred in conservation priority areas such as the Chesapeake Bay, Long Island Sound, the Great Lakes, and other watersheds specifically targeted by the President's Water Quality Initiative.

In July, USDA conducted the first signup opportunity under a pilot Wetland Reserve Program involving nine states. Under the program, farmers with land capable of being restored can receive an easement payment plus 75 percent cost-sharing to re-establish the wetland. Farmers offered 466,000 acres in this initial signup, but only 50,000 acres, at a cost of $46.4 million, are expected to be accepted.

The use of conservation tillage continues to increase as farmers find the practice more attractive and as highly erodible fields are brought into compliance with the conservation provisions of the 1985 Food Security Act. Conservation tillage, which is in many conservation compliance plans, was applied on 79 million acres in 1991, up from 73 million in 1990. The Soil Conservation Service has assisted farmers in developing plans for 140 million acres of highly erodible land. To date, plans have been implemented on 56 percent of these acres. Farmers must complete implementation by 1995 to be eligible for most USDA program benefits. Through USDA conservation programs, farmers are reducing soil erosion by an estimated 1 billion tons annually. Further reductions are expected as the remaining highly erodible lands are brought into compliance.

Soil moisture is generally favorable in the East, although cool weather has slowed crop progress in areas of the Midwest, Mid-Atlantic, and Southeast. In the West, drought conditions intensified due to below-normal winter snow and limited spring and summer rainfall. Stored surface water supplies for irrigation are well below normal in California, Utah, and Oregon, with the most acute shortage in Nevada. Producers are responding by increasing groundwater use, shifting irrigation water to higher valued crops, increasing water conservation, and foregoing production on some land.

Cropland

Acreage Up from 1991

The 343 million cropland acres expected to be used for crops in 1992 are up 6 million (1.8 percent) from 1991 (table 1). After peaking at 387 million acres in 1981, when no land was idled under Federal programs, cropland used for crops trended down through 1988. This decline was mainly due to increased farmer participation in Federal programs aimed at limiting crop production or soil erosion. Land idled by Federal programs declined 22 percent (16.9 million acres) from 1988 to 1989, but increased 6 percent (3.7 million acres) over the 1989 to 1991 period. Cropland used for crops increased 14 million acres from 1988 to 1989 and declined about 4 million acres from 1989 to 1991. In 1992, cropland used for crops increased 6 million acres, about 2 million above 1989 and 1990. However, due to the decline in summer fallowed land since 1987, the estimated 1992 cropland harvested is higher than any year since 1986.

The increase in estimated cropland harvested and used for crops resulted principally from the smaller acreage reduction program (ARP) requirements for most program crops. The land idled by Federal programs decreased 10.8 million acres from 1991 to about 54 million acres in 1992 (table 1, figure 1). This year's decrease was the net result of 11.8 million fewer acres idled in annual crop programs and 1.0 million more acres newly enrolled in the Conservation Reserve Program (CRP). The 1992 acreage idled is the smallest since 1986 (the year enrollments began in the CRP).

Farmers intend to harvest about 311 million acres of principal crops, which together with minor crops will likely raise total harvested acres in 1992 to nearly 324 million. About 12 million acres of the total harvested are estimated to be double cropped. After allowing for double cropping, harvested cropland is expected to total about 312 million acres. This estimated harvested acreage is about 6 million above last year but 40 million below the 1981 high.

An estimated 23 million acres were summer fallowed in 1992, down about a million acres from 1991 (table 1). It is likely that some additional land normally summer fallowed has been contracted into the CRP since 1991. Lower set-aside requirements for most program crops also contributed to the decline since 1987.

Table 1--Major uses of cropland, United States 1/

Cropland	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992 2/
					Million acres					
Cropland used for crops	333	373	372	357	331	327	341	341	337	343
Cropland harvested 3/	294	337	334	316	293	287	306	310	306	312
Crop failure	5	6	7	9	6	10	8	6	7	8
Cultivated summer fallow	34	30	31	32	32	30	27	25	24	23
Cropland idled by all Federal programs	78	27	31	48	76	78	61	62	65	54
Annual programs	78	27	31	46	60	53	31	28	30	18
Long-term programs	0	0	0	2	16	25	30	34	35	36
Total, specified uses 4/	411	400	403	405	407	405	402	403	402	397
					Million hectares					
Cropland used for crops	135	151	151	144	134	132	138	138	136	139
Cropland harvested 3/	119	136	135	128	119	116	124	125	124	126
Crop failure	2	2	3	4	2	4	3	2	3	3
Cultivated summer fallow	14	12	13	13	13	12	11	10	10	9
Cropland idled by all Federal programs	32	11	13	19	31	32	25	25	26	22
Annual programs	32	11	13	19	24	21	13	11	12	7
Long-term programs	0	0	0	1	6	10	12	14	14	15
Total, specified uses 4/	166	162	163	164	165	164	163	163	163	161

1/ Includes the 48 conterminous states. Fewer than 200,000 acres (80,940 hectares) were used for crops in Alaska and Hawaii. 2/ Preliminary. 3/ A double-cropped acre is counted as one acre (0.4047 hectare). 4/ Does not include cropland pasture or idle land not in Federal programs that is normally included in the total cropland base. Breakdown may not add to totals due to rounding.

Figure 1
Major Uses of U.S. Cropland

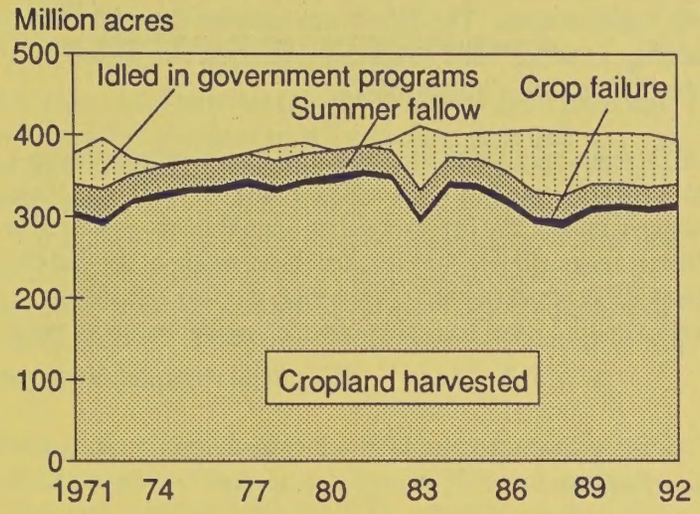
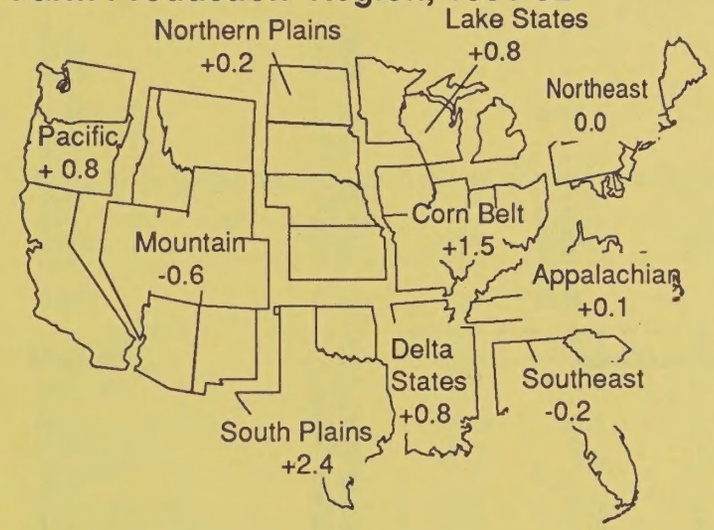


Figure 2
Change in Cropland Used for Crops by Farm Production Region, 1991-92



In million acres.

Crop failure is estimated to be 8 million acres, about 2.5 percent of the planted acreage. Crop failure has declined from 1988, when severe drought devastated several regions, and is about the same as in 1989. It is also about a million acres higher than the average for the last decade. The estimated crop failure does reflect sharp regional changes from last year. These include lower estimated crop failure in the Delta States and a higher failure in the Corn Belt, Southern Plains, Northern Plains, and Mountain regions (table 2). The regional pattern in crop failure estimated for 1992 is more like the pattern estimated in 1989 than that of more recent years.

Note: *As a result of Hurricane Andrew, the acreage of crops harvested may decline and crop failure rise. Although the effect will be slight nationally, it may be significant in the Southeast and Delta regions. This change will not affect the estimate of cropland used for crops.*

Cropland Increases in 7 of the 10 Farm Production Regions in 1992

Cropland used for crops in 1992 is higher than last year in 7 of the 10 farm production regions (figure 2). Cropland used for crops increased the most in the Southern Plains region, 2.4 million acres or 8.2 percent from 1991. Successively smaller percentage increases from 1991 are estimated for the Delta States, Pacific, Lake States, Corn Belt, Appalachian, and Northern Plains regions (table 2). There was essentially no change in cropland in the Northeast, while cropland declined from 1991 in the Southeast and Mountain regions.

The increase in cropland acres in the Southern Plains resulted from increases in wheat, sorghum, and soybeans. In the Delta States, cropland increased due to larger acreages of corn, sorghum, soybeans, cotton, and rice (table 7). In contrast, cotton declined in the Southern Plains and nationally. In aggregate, wheat, corn, sorghum, rice and soybeans increased in area over 1991. The harvested acreages of barley and cotton are estimated to decline in 1992.

Barley acreage is down largely due to net returns favoring spring wheat over barley in the Northern Plains this year. Cotton acreage was relatively unaffected by the higher ARP in 1992, as a larger acreage was enrolled in the program than participated last year. Of greater impact to the cotton acreage harvested was extremely high failure--more than 2 million acres--in Texas due to wet weather and disease problems. Much of the failed cotton acreage was replanted to sorghum, some to soybeans.

Fewer acres were idled in Federal programs in all regions in 1992 than in 1991 (see table 3). In fact, there was a net decrease of 10.8 million acres in land idled in annual programs and the CRP from 1991 to 1992 (excluding 0/92 and 50/92 acreage planted to minor oilseeds).

Idled Acreage Decreases Below Any Year Since 1986

About 53.7 million acres were idled under Federal programs this year (table 3). This excludes an additional 0.7 million acres of feed grain and wheat base idled from program crop production under 0/92 or 50/92 provisions, which were planted to minor oilseeds as allowed by the 1990 Farm Act. Only about one in three of the 1992 idled acres--18.3 million--is in annual Federal acreage reduction programs (excluding the 0/92 and 50/92 programs not planted to minor oilseeds). The balance of the 1992 idled acres are enrolled in the CRP.

Following the pattern from 1987-90, fewer acres were idled by annual crop programs in 1992 than in 1991 (table 4). More importantly, fewer acres were idled by the annual crop programs than in any year since 1982. The only increases in idled base acres were oats, 0.1 million acres (20 percent) and cotton, 0.4 million acres (33 percent). Although the idled base acreage of oats and cotton increased, the total idled base acreage of all program crops decreased, continuing a downward trend since 1987.

In contrast to the total decrease in land idled by annual programs, an additional 1.0 million base acres were enrolled in the CRP in the 11th signup. However, net base acreage idled by both programs in 1992 decreased by 11.2 million acres from a year earlier to the lowest level since the CRP began--40.9 million acres. The differences between the total idled acreage in tables 3 and 4 represents nonbase acres idled by the CRP in 1986 through 1992.

All acreage enrolled in the CRP must remain idle in vegetative cover for the full 10-year life of the CRP contract. Base acreage in the CRP is preserved and could return as effective base acreage eligible for program participation at the end of the CRP contract (table 5). However, it could also remain idle without loss of base after contract expiration under provi-

Table 2--Cropland used for crops in 1992, and 1991-92 change, by region

Region	Cropland used for crops 1/				Share of all cropland used for crops
	Cropland harvested	Crop failure	Summer fallow	Total	
1992:	Million acres				Percent
Northeast	11.1	0.1	-	11.2	3.3
Lake States	34.7	0.4	-	35.1	10.2
Corn Belt	81.1	0.9	-	82.0	23.9
Northern Plains	76.1	1.3	11.6	89.0	26.0
Appalachian	16.4	0.2	-	16.6	4.8
Southeast	9.6	0.2	-	9.8	2.9
Delta States	15.7	0.2	-	15.9	4.6
Southern Plains	27.1	3.4	1.0	31.5	9.2
Mountain	24.1	0.8	8.0	32.9	9.6
Pacific	15.7	0.4	2.7	18.8	5.5
United States 2/	311.5	7.9	23.3	342.8	100.0
	Million hectares				Percent
Northeast	4.5	3/	-	4.5	3.3
Lake States	14.0	0.2	-	14.2	10.2
Corn Belt	32.8	0.4	-	33.2	23.9
Northern Plains	30.8	0.5	4.7	36.0	26.0
Appalachian	6.6	0.1	-	6.7	4.8
Southeast	3.9	0.1	-	4.0	2.9
Delta States	6.4	0.1	-	6.4	4.6
Southern Plains	11.0	1.4	0.4	12.7	9.2
Mountain	9.8	0.3	3.2	13.3	9.6
Pacific	6.4	0.2	1.1	7.6	5.5
United States 2/	126.1	3.2	9.4	138.7	100.0
1991-92 change:	Percent				
Northeast	0.0	0.0	4/	0.0	
Lake States	2.4	0.0	4/	2.3	
Corn Belt	1.6	28.6	4/	1.9	
Northern Plains	1.6	18.2	-9.4	0.2	
Appalachian	0.6	0.0	4/	0.6	
Southeast	-2.0	0.0	4/	-2.0	
Delta States	6.8	-50.0	4/	5.3	
Southern Plains	5.4	25.9	42.9	8.2	
Mountain	-2.0	14.3	-2.4	-1.8	
Pacific	3.3	0.0	12.5	4.4	
United States 2/	1.8	14.5	-3.3	1.7	

- = None or fewer than 50,000 acres (20,234 hectares).

1/ Preliminary. Based on farmers' intentions to harvest. 2/ Includes the 48 conterminous States. Fewer than 200,000 acres (80,940 hectares) were used for crops in Alaska and Hawaii. Breakdown may not sum to totals due to rounding. 3/ More than 20,235 hectares (50,000 acres) but less than 50,000 hectares. 4/ No change or less than 0.05 percent.

sions of the 1990 Farm Act. A more detailed description of CRP enrollments is presented later in this report.

Commodity Acreage Reduction Requirements

Feed Grains. Participants in the 1992 feed grain programs were required to idle at least 5 percent of their base acreage of corn, sorghum, and barley in the ARP. This requirement was down from 7.5 percent in 1991 and from 10 percent in 1990 and 1989. Also, there has been no paid land diversion (PLD) since 1988. The 1992 oats program, as in 1991, required no idling of base acres; the oats ARP is mandated at zero under the 1990 Farm Act. In 1988-90, 5 percent of oats base acres had to be idled.

Feed grain acreage idled in the 1992 program totals about 9.6 million compared with 12.4 million in 1991 and about 17 million in 1990 and 1989 (table 4). About 1.5 million fewer feed grain base acres were enrolled in Federal crop programs in 1992 than in 1991. However, the 2.8-million-acre decrease in idled acres is due largely to the lower ARP requirements for corn, sorghum, and barley in 1992.

In addition to the annual program participation, 10.7 million acres of feed grain base have been enrolled in the CRP--about 9 percent of the 1992 national feed-grain base acres. The idled oats base represents participation in the 0/92 program as no ARP idling was required for oats in 1992. Provisions of the 1993 feed grain program will be announced by September 30.

Harvest estimates of feed grains are up 4.8 million acres from 1991. This is the net of increases of 3.4 million corn acres, 2.5 million sorghum acres, and a decrease of 1.1 million barley acres. There was essentially no change in oats from 1991.

Wheat. Participating wheat growers idled 5 percent of base acreage in 1992 compared with 15 percent in 1991, 5 percent in 1990, and 10 percent in 1989. About 6.7 million acres of wheat base were idled in the annual program, compared with 15.6 million last year. Although nearly 3 million fewer acres were enrolled in 1992 than in 1991, this is largely due to lower ARP requirements. Idling under 0/92 provisions was 2 million acres less in 1992 than in 1991. In addition, 10.6 million acres of wheat base were enrolled in the CRP for 1992, an increase of 0.2 million acres from last year. [Wheat

Table 3--Cropland idled under Federal acreage reduction programs, by region

Region	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992 1/
					Million acres					
Northeast	1.0	0.1	0.2	0.5	0.9	0.9	0.7	0.7	0.6	0.5
Lake States	8.0	1.6	2.0	4.2	7.0	6.7	4.7	4.7	4.7	4.0
Corn Belt	17.9	2.9	3.8	8.5	15.3	13.9	8.8	9.0	8.2	7.3
Northern Plains	20.9	9.4	10.1	14.3	19.7	20.8	15.8	16.8	18.4	14.4
Appalachian	2.6	0.3	0.5	1.3	2.7	3.0	2.3	2.3	2.1	1.9
Southeast	2.3	0.5	0.7	1.3	3.0	3.2	3.0	3.0	2.9	2.8
Delta States	3.5	1.3	1.9	2.4	3.5	3.1	3.0	2.6	2.7	2.2
Southern Plains	12.8	5.7	5.9	8.3	11.7	12.0	10.0	9.8	11.0	8.8
Mountain	6.1	3.9	3.9	5.4	8.7	10.2	9.1	9.6	10.5	9.0
Pacific	2.9	1.3	1.6	2.2	3.5	3.8	3.2	3.1	3.6	3.0
United States 2/ 3/	77.9	27.0	30.7	48.1	76.2	77.7	60.8	61.6	64.5	53.7
					Million hectares					
Northeast	0.4	4/	0.1	0.2	0.4	0.4	0.3	0.3	0.2	0.2
Lake States	3.2	0.6	0.8	1.7	2.8	2.7	1.9	1.9	1.9	1.6
Corn Belt	7.2	1.2	1.5	3.4	6.2	5.6	3.6	3.6	3.3	3.0
Northern Plains	8.5	3.8	4.1	5.8	8.0	8.4	6.4	6.8	7.4	5.8
Appalachian	1.1	0.1	0.2	0.5	1.1	1.2	0.9	0.9	0.8	0.8
Southeast	0.9	0.2	0.3	0.5	1.2	1.3	1.2	1.2	1.2	1.1
Delta States	1.4	0.5	0.8	1.0	1.4	1.3	1.2	1.1	1.1	0.9
Southern Plains	5.2	2.3	2.4	3.4	4.7	4.9	4.0	4.0	4.5	3.6
Mountain	2.5	1.6	1.6	2.2	3.5	4.1	3.7	3.9	4.2	3.6
Pacific	1.2	0.5	0.6	0.9	1.4	1.5	1.3	1.3	1.5	1.2
United States 2/ 3/	31.5	10.9	12.4	19.5	30.8	31.4	24.6	24.9	26.1	21.7

1/ Preliminary. 2/ Includes the 48 conterminous States. Because of rounding, regional data may not sum to U.S. totals. 3/ Includes cropland idled by 0/92 and 50/92 programs from 1986 through 1992, except for about 0.5 million acres (0.2 million hectares) in 1991 and 0.7 million acres (0.3 million hectares) in 1992 enrolled in 0/92 or 50/92 programs and planted to minor oilseeds. Also includes 2.0 million acres (0.8 million hectares) enrolled in the Conservation Reserve Program in 1986, 15.7 million acres (7.0 million hectares) enrolled in 1987, 24.5 million acres (9.9 million hectares) enrolled in 1988, 29.8 million acres (12.1 million hectares) enrolled in 1989, 33.9 million acres (13.7 million hectares) enrolled in 1990, 34.4 million acres (13.9 million hectares) enrolled in 1991, and 35.4 million acres (14.3 million hectares) enrolled in 1992. 4/ Less than 50,000 hectares.

harvest is estimated at 63.1 million acres in 1992, up 5.4 million from last year (table 7)]. A zero percent wheat acreage reduction program (ARP) has been announced for 1993.

Cotton and Rice. Participation in the upland cotton program in 1992 required the idling of 10 percent of base acres. This requirement compares with the required idling of 5 percent of base acres in 1991, 12.5 percent of base in 1990, and 25 percent in 1989. The extra-long staple (ELS) cotton program required idling 5 percent of base in 1992. This requirement has been unchanged since 1989.

Cotton base acres idled in the annual program in 1992 totalled 1.6 million, up just 0.4 million from 1991. Cotton base acres idled by the ARP more than doubled in 1992 due to doubling of the set-aside requirement and a 0.7 million acre increase in enrolled base from 1991. However, cotton acreage idled in the 50/92 program declined by half from 1991 to 1992. The cotton acreage expected to be harvested

Table 4.--Base acreage idled under Federal acreage reduction programs, United States

Program and crop	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992 1/
					Million acres					
Annual programs:										
Corn	32.2	3.9	5.4	14.2	23.2	20.5	10.8	10.7	7.4	5.1
Sorghum	5.7	0.6	0.9	2.9	4.1	3.9	3.3	3.3	2.4	1.9
Barley	1.1	0.5	0.7	2.0	3.0	2.8	2.3	2.9	2.1	2.0
Oats	0.3	0.1	0.1	0.5	0.8	0.3	0.3	0.2	0.5	0.6
Wheat	30.0	18.6	18.8	21.0	23.9	22.5	9.6	7.5	15.6	6.7
Cotton	6.8	2.5	3.6	4.0	3.9	2.2	3.5	2.0	1.2	1.6
Rice	1.8	0.8	1.2	1.5	1.6	1.1	1.2	1.0	0.9	0.4
Total, annual programs 2/	77.9	27.0	30.7	46.1	60.5	53.3	30.9	27.7	30.1	18.3
Conservation Reserve Program: 3/										
Corn				0.2	2.3	2.8	3.4	3.8	3.9	4.1
Sorghum				0.2	1.2	1.9	2.2	2.4	2.4	2.4
Barley				0.1	1.1	1.9	2.4	2.7	2.8	2.8
Oats				0.1	0.5	0.9	1.1	1.3	1.3	1.4
Wheat				0.6	4.2	7.1	8.8	10.3	10.4	10.6
Cotton				0.1	0.7	1.0	1.2	1.3	1.3	1.4
Rice				4/	4/	4/	4/	4/	4/	4/
Total, Conservation Reserve Program 2/				1.2	10.0	15.5	19.0	21.8	22.0	22.6
Total base acres idled 2/	77.9	27.0	30.7	47.4	70.5	68.8	49.9	49.5	52.1	40.9
					Million hectares					
Annual programs:										
Corn	13.0	1.6	2.2	5.7	9.4	8.3	4.4	4.3	3.0	2.1
Sorghum	2.3	0.2	0.4	1.2	1.7	1.6	1.3	1.3	1.0	0.8
Barley	0.4	0.2	0.3	0.8	1.2	1.1	0.9	1.2	0.8	0.8
Oats	0.1	5/	5/	0.2	0.3	0.1	0.1	0.1	0.2	0.2
Wheat	12.1	7.5	7.6	8.5	9.7	9.1	3.9	3.0	6.3	2.7
Cotton	2.8	1.0	1.5	1.6	1.6	0.9	1.4	0.8	0.5	0.6
Rice	0.7	0.3	0.5	0.6	0.6	0.4	0.5	0.4	0.4	0.2
Total, annual programs 2/	31.5	10.9	12.4	18.7	24.5	21.6	12.5	11.2	12.2	7.4
Conservation Reserve Program: 3/										
Corn				0.1	0.9	1.1	1.4	1.5	1.6	1.7
Sorghum				0.1	0.5	0.8	0.9	1.0	1.0	1.0
Barley				5/	0.4	0.8	1.0	1.1	1.1	1.1
Oats				5/	0.2	0.4	0.4	0.5	0.5	0.6
Wheat				0.2	1.7	2.9	3.6	4.2	4.2	4.3
Cotton				5/	0.3	0.4	0.5	0.5	0.5	0.6
Rice				4/	4/	4/	4/	4/	4/	4/
Total, Conservation Reserve Program 2/				0.5	4.0	6.3	7.7	8.8	8.9	9.1
Total base acres idled 2/	31.5	10.9	12.4	19.2	28.5	27.8	20.2	20.0	21.1	16.6

1/ Preliminary. 2/ Because of rounding, crop acreages may not sum to the totals. Base acreages idled under 0/92 and 50/92 programs from 1986 through 1992 are included in annual program data. However, base acres of feed grains and wheat enrolled in 0/92 and planted to oilseeds in 1991 (0.5 million acres) and in 1992 (0.7 million acres) are not included. 3/ Program began in 1986. Small acreages of peanut and tobacco base were bid into the CRP in addition to the crops listed. 4/ Less than 50,000 acres (20,235 hectares). 5/ Less than 50,000 hectares.

in 1992 is 1.6 million acres (12 percent) less than was harvested in 1991 (table 7). This decrease is indicated despite a net gain in cotton acreage as a result of the crop flex provisions in 1992 (table 6). The decrease is largely due to extremely high crop failure in Texas because cool wet weather lead to disease problems early in the season. An estimated 1.1 million acres of failed cotton were replanted to sorghum.

The 1992 rice program has a zero ARP requirement in contrast to a 5 percent idling of base acres in 1991, 20 percent in 1990, and 25 percent in 1989. However, to be eligible for loans, purchases, and payments for the 1992 crop, rice producers could not plant more than their rice acreage base plus possible plantings on flex acres of other program crops. Actual participation resulted in 0.4 million acres of rice base idled in the 50/92 program, down nearly 56 percent from the total rice base idled in 1991. The enrolled rice base acreage is identical in 1992 to the complying base acreage in 1991, in spite of the zero ARP requirement.

In addition to the annual program participation, just 1.4 million cotton base acres and 14,338 rice base acres were enrolled in the CRP for 1992. Announcement of the provisions of the upland cotton program for 1993 are expected by November 1.

Idled Acreage Down In All Regions

Between 1991 and 1992, total acreage idled by Federal programs decreased in all farming regions. The decrease was greatest in the Northern and Southern Plains and least in the Northeast and Southeast regions (table 3). The decreases ranged from 0.1 million acres in the Southeast and Northeast regions to 4.0 million acres in the Northern Plains region. The largest proportional decreases occurred in the Northern Plains, Southern Plains, and Delta States where 22, 20, and 19 percent less acreage, respectively, was idled.

Participation in the annual crop programs changed very little from 1991 to 1992. The enrolled base acreage of sorghum, oats, and cotton increased slightly. The rice base enrolled was the same as last year, but participation in the other program crops declined. In total, enrolled base acres of the program crops decreased about 2 percent from the complying base acreage in 1991 (table 5).

Base Acreage Down From 1985 Peak

Total base acreage of major program crops--wheat, feed grains, cotton, and rice--reached a peak for the last decade at 240.3 million acres in 1985 (table 5). However, since 1986

Table 5--Principal and program crops planted, total base acreage, and other Federal program acreage statistics and relationships

Item	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992 1/
					Million acres					
Principal crops planted	309.4	345.0	342.1	327.2	304.9	308.1	317.2	319.4	314.2	319.9
Program crops planted	189.3	215.4	216.9	204.3	185.4	182.8	196.0	195.8	191.5	197.4
Total base acreage of program crops	229.8	234.4	240.3	235.0	236.4	239.2	239.0	238.4	235.3	235.2
Base acres in CRP 2/				1.2	10.0	15.5	19.0	21.8	22.1	22.7
Effective base acreage 3/	229.8	234.4	240.3	233.8	226.4	223.7	220.0	216.6	213.2	212.5
Complying base acreage	168.1	128.6	162.8	192.9	197.2	187.8	168.0	166.6	169.0	165.5 4/
Annual program set-aside	77.9	27.0	30.7	46.1	60.5	53.3	30.9	27.7	30.1 5/	18.3 5/
Complying base minus set-aside	90.2	101.6	132.1	146.8	136.7	134.5	137.1	138.9	138.9	147.2 4/
Complying base planted	79.8	88.0	116.1	135.5	131.6	125.0	123.1	132.1	127.4	137.2
					Million hectares					
Principal crops planted	125.2	139.6	138.4	132.4	123.4	124.7	128.4	129.3	127.2	129.5
Program crops planted	76.6	87.2	87.8	82.7	75.0	74.0	79.3	79.2	77.5	79.9
Total base acreage of program crops	93.0	94.9	97.2	95.1	95.7	96.8	96.7	96.5	95.2	95.2
Base acres in CRP 2/				0.5	4.0	6.3	7.7	8.8	8.9	9.2
Effective base acreage 3/	93.0	94.9	97.2	94.6	91.6	90.5	89.0	87.7	86.3	86.0
Complying base acreage	68.0	52.0	65.9	78.1	79.8	76.0	68.0	67.4	68.4	67.0 4/
Annual program set-aside	31.5	10.9	12.4	18.7	24.5	21.6	12.5	11.2	12.2 5/	7.4 5/
Complying base minus set-aside	36.5	41.1	53.5	59.4	55.3	54.4	55.5	56.2	56.2	59.6 4/
Complying base planted	32.3	35.6	47.0	54.8	53.3	50.6	49.8	53.5	51.6	55.5
					Percent					
Effective base acreage as percentage of principal crops planted	74.3	67.9	70.2	71.5	74.3	72.6	69.4	67.8	67.9	66.4
Complying base acreage as percentage of effective base acreage	73.2	54.9	67.7	82.5	87.1	84.0	76.4	76.9	79.3	77.9 4/
Complying base acreage as percentage of program crops planted	88.8	59.7	75.1	94.4	106.4	102.7	85.7	85.1	88.3	83.8 4/
Complying base planted as percentage of program crops planted	42.2	40.9	53.5	66.3	71.0	68.4	62.8	67.5	66.5	69.5

1/ Preliminary. 2/ Program began in 1986. 3/ Total base acreage of program crops less base acres in CRP.
4/ Based on enrolled base acres for 1992. 5/ Excludes land in 0/92 and 50/92 programs planted to minor oilseeds.

the CRP has cut the effective base acreage each crop year, until this year it reached a low for more than the last decade.

Complying base acreage is the effective base acreage certified for participation in annual commodity programs. Participation in annual crop programs varies for several reasons, including the attractiveness of program provisions and the outlook for crop prices. The portion of the effective base enrolled in 1992 is 77.9 percent, down 1.4 percentage points from compliance in 1991 but higher than in 1989 and 1990. It is 9.2 percentage points below the peak participation in 1987 (table 5).

The maximum acreage that program participants may plant is the complying base acreage minus the acreage required to be idled (ARP). Because not all program participants plant maximum acreage, the complying base actually planted is less. Many producers use the 0/92 and 50/92 programs to idle additional acreage.

Total acreage of program crops planted includes that planted by nonparticipants as well as the complying base planted by participants. The proportion of program-crop acreage enrolled in Federal programs rose from 42 percent in 1983 to 71 percent in 1987 and declined from 1987 through 1989. In 1990 and 1991, about two-thirds of the acreage of all program crops was planted by participants in annual Federal programs. Based on program crop enrollment, that proportion will likely be a little larger in 1992.

Flex Acre Provisions Allow Considerable Shift From Corn to Soybeans

Under 1990 farm legislation, the definition of "maximum payment" acreage limits deficiency payments to program participants to 85 percent of the base acreage established for their program crop less the acreage required to be idled by the ARP requirement. The 15 percent of base acres on which deficiency payments will not be made are called "normal flex acres." These normal flex acres can be planted to

Table 6--Use of crop base flex area by program crop, 1992 1/

1992 Use of flex area	Program crop base acreage flexed							
	Corn	Sorghum	Barley	Oats	Wheat	Cotton	Rice	Total
	Thousand acres							
Flexed to other program crops	-354	-260	-385	-229	-1,010	-102	-57	-2,397
Flexed from other program crops	626	319	63	53	756	452	24	2,293
Flexed to nonprogram crops:								
Soybeans	-2,252	-270	-133	-85	-1,444	-176	-257	-4,617
Minor oilseeds	-61	-23	-42	-15	-204	-15	-27	-387
Other nonprogram crops	-169	-61	-101	-31	-506	-26	-29	-923
Subtotal - Nonprogram crops	-2,482	-354	-276	-131	-2,154	-217	-313	-5,927
Net change due to crop base flex provisions	-2,210	-295	-598	-307	-2,408	133	-346	-6,031
Normal flex acres 2/	-9,289	-1,578	-1,241	-440	-9,746	-1,932	-579	-24,805
Optional flex acres 3/	-6,192	-1,052	-827	-294	-6,497	-1,288	-386	-16,537
Total flex acres possible	-15,481	-2,629	-2,068	-734	-16,244	-3,221	-964	-41,342
	Thousand hectares							
Flexed to other program crops	-143	-105	-156	-93	-409	-41	-23	-970
Flexed from other program crops	253	129	25	21	306	183	10	928
Flexed to nonprogram crops:								
Soybeans	-911	-109	-54	-34	-584	-71	-104	-1,868
Minor oilseeds	-25	-9	-17	-6	-83	-6	-11	-157
Other nonprogram crops	-68	-25	-41	-13	-205	-11	-12	-374
Subtotal - Nonprogram crops	-1,004	-143	-112	-53	-872	-88	-127	-2,399
Net change due to crop base flex provisions	-894	-119	-242	-124	-974	54	-140	-2,441
Normal flex area 2/	-3,759	-638	-502	-178	-3,944	-782	-234	-10,038
Optional flex area 3/	-2,506	-426	-335	-119	-2,629	-521	-156	-6,692
Total flex area possible	-6,265	-1,064	-837	-297	-6,574	-1,303	-390	-16,730

1/ A negative number indicates the area flexed (or available for flexing) out of the crop heading the column to another crop. A positive number indicates the area flexed into the crop heading the column from another program crop. 2/ Normal flex acres were computed as 15 percent of enrolled base acres of the program crops. 3/ Optional flex acres could be up to an additional two-thirds of the normal flex acres (10 percent of enrolled base acres).

the original program crop, another program crop, or an approved flex crop.

Planting flexibility provides some incentive for movement toward a wider selection of crops and increased crop rotation. It was originally proposed to allow a range of crop choices to producers without loss of income support payments or base acreage eligible for support. As a result of the Budget Reconciliation Act of 1990, which amended the 1990 Farm Act, deficiency payments on normal flex acres were eliminated. Base acreage, however, would be retained in the program crop if the land use was flexed to other crops.

In addition to normal flex acres, another 10 percent of program crop base acres could be used as optional flex acres. If a crop other than the original program crop is produced on these acres, the optional flex acres are also not eligible for deficiency payments. However, for both normal and optional flex acres, program crops and oilseeds grown on flexed acres are eligible for price support loans. The flexed acres are also considered planted to the program crop, thereby protecting the base. Crops specifically excluded from production on flexed acres are fruits and vegetables, including potatoes, dry edible beans, lentils, and specified types of dry peas. Any other crops may be excluded by the Secretary of Agriculture. In 1991, peanuts, tobacco, wild rice, nuts, trees, and tree crops were also excluded. In 1992, mung beans were specifically permitted on flex acres. This was the only revision to the crops permitted in 1992.

Based on program crop enrollment in 1992, normal flex acres would comprise about 24.8 million acres (table 6). An additional 16.5 million more could be optionally flexed. Program enrollment for 1992 shows about 8.3 million acres of gross flexed acreage of the potential 41.3 million acres. This would infer that a high proportion of normal flex acres were still planted to the original program crop and that the optional provision was not heavily used. After accounting for land shifted from one program crop to another, the net flex acres amount to about 6.0 million acres, of which 5.9 million were flexed to nonprogram crops (table 6).

The information in table 6 indicates the direction and magnitude of flex acreage changes for each program crop at the head of each column. That is, 354,000 acres were flexed out of corn and into another program crop. In turn, corn gained 626,000 acres flexed from other program crops. In total, including land flexed into nonprogram crops, corn lost nearly 2.2 million acres, of which the acreage flexed to soybeans was 102 percent of the net acreage flexed. This was the result of a larger acreage being flexed into corn from other program crops than was flexed out of corn to other program crops.

Although there were shifts into and out of each of the program crops, only corn, sorghum, and cotton gained larger areas than they lost to other program crops through the flex provisions. On a relative basis, cotton gained considerably more than corn or sorghum and was the only program crop to have a net acreage increase from the crop flex provisions. Cotton increased by 133,000 acres, net of land flexed from cotton to other crops. In contrast, even though corn gained more acres from other program crops than was flexed to other program crops, corn experienced a considerable acreage loss, primarily to soybeans. Soybeans gained more than 4.6 million acres (77 percent) of the more than 6 million net flex acres from all program crops in 1992.

In comparing the gross acres (both normal and optional) flexed out of program crops to the potential normal flex acres, a smaller proportion of cotton acres were flexed (17 percent) followed by corn (31 percent). Oats experienced the greatest flex of acres to other crops--nearly 82 percent. The relatively low shifts in crops through the acreage flex provisions suggests that producers' preferred crop rotations have not been constrained by past base acreage provisions. In some cases, producers face a limited set of planting options. The pattern of acreage flexing in 1992 is quite similar to 1991. A year of experience with the base acreage flex provisions did little to affect the pattern or extent of participation in this aspect of the farm programs.

Wheat, Corn, Sorghum, Rice, and Soybeans Acreage Up in 1992

Harvested acreage of wheat, corn, sorghum, rice, and soybeans is expected to rise in 1992, while barley and cotton falls. The acreage of oats harvested is essentially unchanged from 1991 (table 7). Total harvested cropland is expected to be up 5.5 million acres from a year earlier. The increase can be mainly attributed to the decrease in land idled in Federal programs which occurred in all regions in 1992 (table 3).

Wheat acreage harvested in 1992 is estimated at 63.1 million acres, up 5.4 million from a year ago and 2.8 million acres above the 1986-90 average. Although a considerable increase, the change from 1991 represents only about 63 percent of the 8.6 million fewer wheat base acres idled in 1992. Several reasons have been suggested for the increase being much smaller than the decrease in wheat base idled by participating producers. Wheat prices were relatively low at winter wheat planting time last fall, and planting conditions were dry for winter wheat in many areas. It was also a first experience with the flexibility provisions of the 1990 farm legislation for many winter wheat producers. Last year over half of the complying base acres in the wheat program were enrolled under the Winter Wheat Option and not subject to the flexibility provisions of the 1990 Farm Act.

Table 7--Harvested area of major crops, by region

Crop	Period	North-east	Lake States	Corn Belt	Northern Plains	Appa-lachian	South-east	Delta States	Southern Plains	Mountain	Pacific	United States 1/
						Million acres						
Corn: 2/												
	1986-90 Ave.	2.3	10.1	32.2	11.3	3.3	1.3	0.4	1.4	1.0	0.3	63.7
	1991	2.2	11.5	34.3	13.3	3.1	1.1	0.5	1.6	1.1	0.2	68.8
	1992	2.4	12.2	35.9	13.6	3.3	1.4	0.7	1.6	1.0	0.2	72.2
Sorghum: 2/												
	1986-90 Ave.	-	-	0.8	5.3	0.1	0.1	0.7	3.2	0.4	-	10.7
	1991	-	-	0.7	4.8	0.1	0.1	0.5	3.2	0.4	-	9.8
	1992	-	-	1.0	5.0	0.1	0.1	0.7	5.0	0.4	-	12.3
Barley:												
	1986-90 Ave.	0.2	1.0	-	3.5	0.1	3/	-	3/	3.1	1.1	9.1
	1991	0.2	1.0	-	3.3	0.1	3/	-	3/	2.8	0.9	8.4
	1992	0.2	0.8	-	3.1	0.1	3/	-	3/	2.3	0.8	7.3
Oats:												
	1986-90 Ave.	0.5	1.8	1.2	2.1	0.1	0.1	3/	0.3	0.2	0.1	6.4
	1991	0.4	1.2	0.8	1.7	0.1	0.1	3/	0.2	0.2	0.1	4.8
	1992	0.3	1.2	1.0	1.6	0.1	0.1	3/	0.2	0.2	0.1	4.8
Wheat:												
	1986-90 Ave.	0.6	3.4	4.6	25.0	1.5	1.2	1.7	9.1	9.4	3.8	60.3
	1991	0.6	2.8	4.8	26.0	1.5	0.8	1.4	7.8	8.6	3.4	57.7
	1992	0.6	3.5	4.1	28.0	1.6	0.7	1.3	9.8	9.4	4.0	63.1
Soybeans:												
	1986-90 Ave.	1.0	6.2	29.6	6.6	4.3	2.3	7.2	0.5	-	-	57.8
	1991	1.2	7.3	30.4	7.1	4.0	1.6	6.0	0.4	-	-	58.0
	1992	1.2	7.5	29.9	7.3	4.0	1.6	6.0	0.6	-	-	58.1
Cotton:												
	1986-90 Ave.	-	-	0.2	3/	0.6	0.8	2.3	4.8	0.5	1.1	10.3
	1991	-	-	0.3	3/	1.1	1.1	3.0	5.8	0.5	1.0	13.0
	1992	-	-	0.3	3/	1.0	1.1	3.2	4.1	0.5	1.1	11.4
Rice:												
	1986-90 Ave.	-	-	3/	-	-	-	1.8	0.3	-	0.4	2.6
	1991	-	-	0.1	-	-	-	2.0	0.3	-	0.3	2.8
	1992	-	-	0.1	-	-	-	2.1	0.3	-	0.4	3.0
						Million hectares						
Corn: 2/												
	1986-90 Ave.	0.9	4.1	13.0	4.6	1.3	0.5	0.2	0.6	0.4	0.1	25.8
	1991	0.9	4.7	13.9	5.4	1.3	0.4	0.2	0.6	0.4	0.1	27.8
	1992	1.0	4.9	14.5	5.5	1.3	0.6	0.3	0.6	0.4	0.1	29.2
Sorghum: 2/												
	1986-90 Ave.	-	-	0.3	2.1	4/	4/	0.3	1.3	0.2	3/	4.3
	1991	-	-	0.3	1.9	4/	4/	0.2	1.3	0.2	-	4.0
	1992	-	-	0.4	2.0	0.0	0.0	0.3	2.0	0.2	-	5.0
Barley:												
	1986-90 Ave.	0.1	0.4	-	1.4	4/	3/	-	4/	1.3	0.4	3.7
	1991	0.1	0.4	-	1.3	4/	3/	-	3/	1.1	0.4	3.4
	1992	0.1	0.3	-	1.3	0.0	0.0	-	0.0	0.9	0.3	3.0
Oats:												
	1986-90 Ave.	0.2	0.7	0.5	0.8	4/	4/	3/	0.1	0.1	0.0	2.6
	1991	0.2	0.5	0.3	0.7	4/	4/	3/	0.1	0.1	4/	1.9
	1992	0.1	0.5	0.4	0.6	0.0	0.0	0.0	0.1	0.1	0.0	1.9
Wheat:												
	1986-90 Ave.	0.2	1.4	1.9	10.1	0.6	0.5	0.7	3.7	3.8	1.5	24.4
	1991	0.2	1.1	1.9	10.5	0.6	0.3	0.6	3.2	3.5	1.4	23.4
	1992	0.2	1.4	1.7	11.3	0.6	0.3	0.5	4.0	3.8	1.6	25.5
Soybeans:												
	1986-90 Ave.	0.4	2.5	12.0	2.7	1.7	0.9	2.9	0.2	-	-	23.4
	1991	0.5	3.0	12.3	2.9	1.6	0.6	2.4	0.2	-	-	23.5
	1992	0.5	3.0	12.1	3.0	1.6	0.6	2.4	0.2	-	-	23.5
Cotton:												
	1986-90 Ave.	-	-	0.0	3/	0.2	0.3	0.9	1.9	0.2	0.4	4.2
	1991	-	-	0.1	3/	0.4	0.4	1.2	2.3	0.2	0.4	5.3
	1992	-	-	0.1	0.0	0.4	0.4	1.3	1.7	0.2	0.4	4.6
Rice:												
	1986-90 Ave.	-	-	4/	-	-	-	0.7	0.1	-	0.2	1.1
	1991	-	-	4/	-	-	-	0.8	0.1	-	0.1	1.1
	1992	-	-	0.0	-	-	-	0.8	0.1	-	0.2	1.2

- = None reported.
1/ Includes the 48 conterminous States. Because of rounding, regional acres (hectares) may not sum to U.S. totals.
2/ Corn and sorghum for grain. 3/ Less than 50,000 acres (20,235 hectares). 4/ More than 20,235 hectares (50,000 acres) but less than 50,000 hectares.

In contrast to the 1990-91 changes where all regions except the Northeast showed reductions in harvested wheat acres, the 1991-92 changes were quite mixed. The largest increases were in the Northern and Southern Plains regions (2 million acres each). These were followed by successively smaller increases in the Mountain, Pacific, Lake States, and Appalachian regions. Decreases in wheat acreage occurred in the Corn Belt, Delta States, and Southeast regions, while the Northeast was unchanged from last year. Most of the regions with 1992 increases in wheat have an estimated harvest area greater than their 1986-90 average. The regions with the largest increases this year--Southern and Northern Plains, each with 2 million acres--had large decreases from 1990-91 (2.8 million acres in the Northern Plains and 2.7 million in the Southern Plains). Large increases in wheat

acreage harvested were also reported in these regions from 1989-90.

Harvested corn acreage in 1992 is forecast at 72.2 million, up 3.4 million from a year earlier. The largest gains are predicted for the Corn Belt (1.6 million acres) and Lake States (0.7 million). This increase in the Corn Belt follows a large increase last year and harvested acreage is estimated to be more than 11 percent above the 1986-90 average. The estimated acreage of corn harvested for grain declined or was unchanged in the Southern Plains, Mountain, and Pacific regions. Acreage gains were reported for all of the other production regions.

Sorghum acres harvested for grain in 1992 are estimated at 12.3 million, up 2.5 million (26 percent) from a year earlier. The acreage increased or was unchanged in all regions that normally produce sorghum, for the second year in a row. The 1992 estimate of harvested sorghum area is nearly 15 percent above the 1986-90 average. A major part of the increase occurred in the Southern Plains region--specifically Texas--where 1.1 million acres of failed cotton were replanted to sorghum. This was in addition to an already strong increase in sorghum in the Southern Plains region. The cotton failure occurred due to unusual rainfall and cool weather in May which resulted in delayed emergence and seedling disease.

The acreage of barley harvested is estimated to decrease 1.1 million acres (13 percent) from 1991. Decreases occurred in the Lake States, Northern Plains, Mountain, and Pacific regions--the same regions that had increases in 1991. The 1992 harvested acreage of barley is nearly 20 percent below the 1986-90 average. Harvested oats acreage is estimated to be unchanged from 1991 at 4.8 million acres.

Soybeans are expected to be harvested on 58.1 million acres in 1992, up only about 0.1 million acres from 1991 in spite of 0.6 million more acres being flexed into soybeans from other program crops. Soybean acreage increased in the Lake States, Northern Plains, Southern Plains, and Delta States regions. However, soybeans declined in the Corn Belt and were unchanged in the Northeast, Appalachian, and Southeast regions.

Harvested acreage of cotton is expected to be 11.4 million in 1992, down 1.6 million from 1991. Land idled in the 1992 annual cotton program increased by 0.4 million acres from the 1991 crop year. Also, an additional 0.1 million acres of cotton base was enrolled in the CRP in 1992. The decrease in cotton acreage harvested is largest in the Southern Plains (1.6 million acres) followed by the Appalachian region. (A major cause of the decline in the Southern Plains was failure in Texas as a result of the wet, cool May.) Small increases in cotton acreage occurred in the Delta States and Pacific regions. The acreage of cotton estimated to be harvested was unchanged in the Corn Belt, Southeast, and Mountain regions.

The acreage of rice harvested is estimated up 0.2 million acres in 1992. This increase is about equally divided between the Delta States and the Pacific regions. The harvested acreage of rice was essentially unchanged in the Corn Belt and Southern Plains regions.

Water Supply and Irrigation

Drought conditions have intensified in western regions due to below-normal levels of winter snow and spring/summer rainfall. Favorable topsoil moisture conditions have returned over much of the East after poor early summer conditions in large areas of the Corn Belt and Mid-Atlantic regions.

Long-term Drought Persists in West

As of early May, drought conditions continued to grip much of the western U.S. (figure 3). The most seriously affected areas included most of Nevada, California, Oregon, Washington, Idaho, and Wyoming, as well as portions of Utah, Colorado, and the Northern Plains.

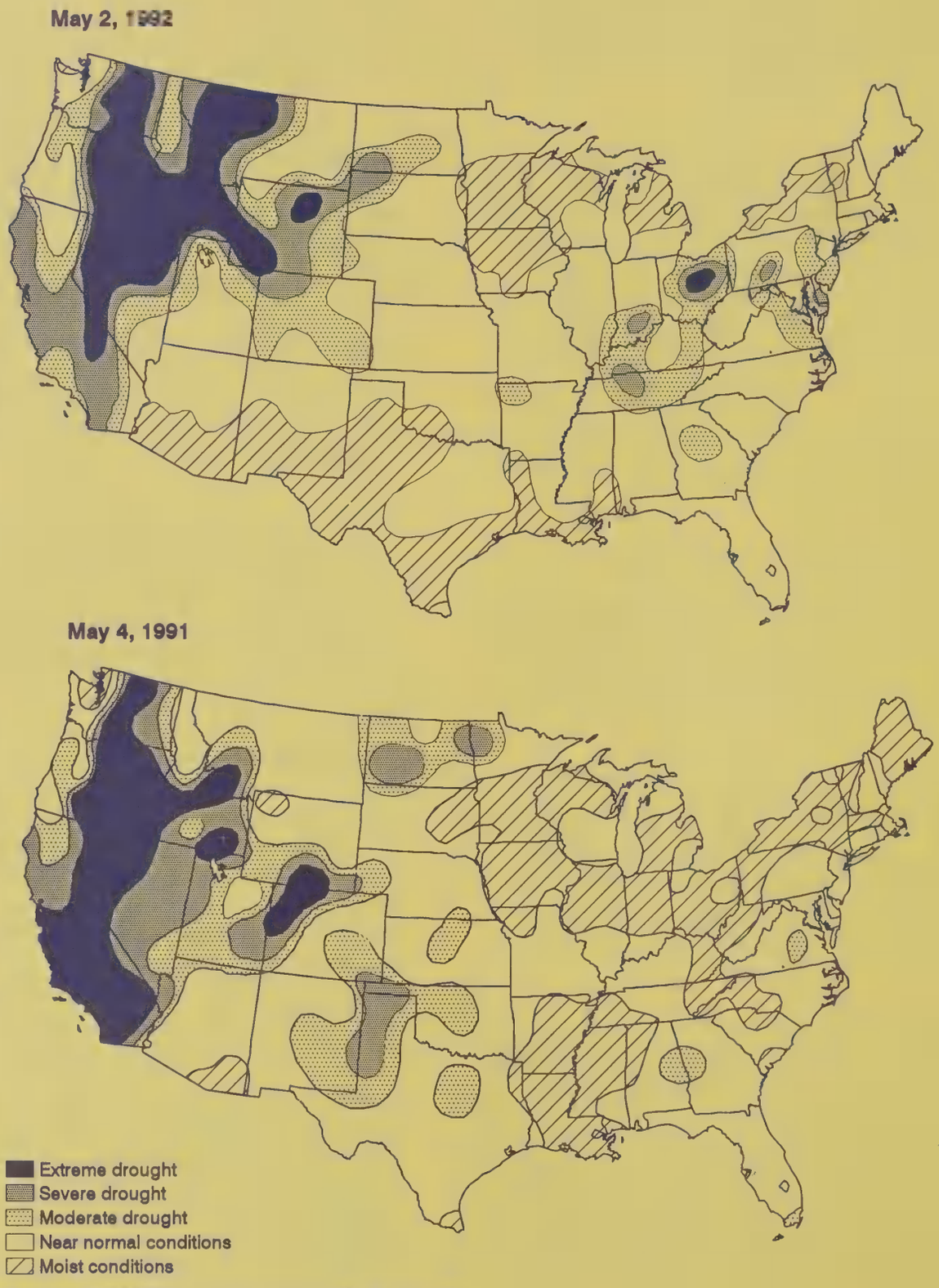
Drought conditions in this report are based on the Palmer Drought Severity Index (PDSI), which measures long-term abnormal dryness or wetness. The PDSI reflects the general status of moisture conditions over the recent past (months/years) in terms of runoff, aquifer recharge from deep percolation, and evapotranspiration. The PDSI responds slowly to current precipitation and does not generally indicate existing crop or field conditions.

Areas of California and Nevada are in their sixth consecutive drought year, while portions of North Dakota, the Pacific Northwest, and Central Mountain regions are in their fifth. Above-normal precipitation alleviated drought conditions in portions of the Southwest, the Southern Plains, and the Northern Plains. Drought conditions have intensified, however, in Montana, Idaho, and Wyoming this year. While the total area under drought remained about the same through the summer of 1992, moisture conditions in the western drought area have worsened with virtually all now classified as extreme.

Heavy rainfall in portions of the Gulf Coast and Southern Plains regions resulted in flooding and wet field conditions during the spring planting and emergence periods. Crop yield losses will occur in these areas due to waterlogging, increased pest problems, limited field access, and reduced growing seasons. Wet weather during the early growing season damaged more than 2 million acres of cotton in the

Figure 8

Drought-Affected Areas Based on Palmer Drought Index, 1992 and 1991



Source: NOAA/USDA Joint Agricultural Weather Facility

Southern Plains, much of which was planted to alternative shorter-season crops.

Early growing-season topsoil moisture conditions were adequate across non-irrigated small-grain producing regions of the Southern Mountain and Plains regions (figure 4). However, low precipitation in the Central and Northern Plains combined with below-normal temperatures to slow crop development. Rainfall delayed the summer harvest of winter wheat in parts of the Southern Plains.

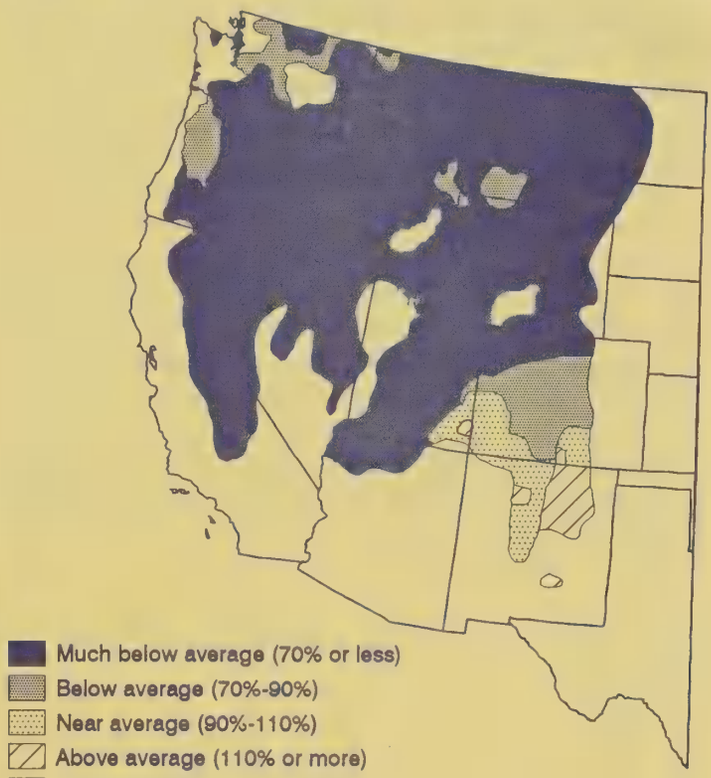
Soil Moisture Conditions Generally Favorable in the East

Drought conditions had developed by spring in the eastern Corn Belt, Mid-Atlantic states and portions of the Southeast (figure 3). Due to timely rains however, topsoil moisture conditions were sufficient for early crop growth (figure 4).

Drier conditions in the early summer extended areas of moderate drought northward into Michigan and Wisconsin and westward through Illinois. Generally cool temperatures in combination with dry soils slowed the growth of corn and other crops, thereby reducing crop water needs relative to normal conditions. Mid-summer brought adequate to excessive rains to much of the East, relieving spring and early summer drought conditions. However, as crop progress was delayed, an earlier-than-normal freeze could prevent crops from reaching maturity.

Figure 5

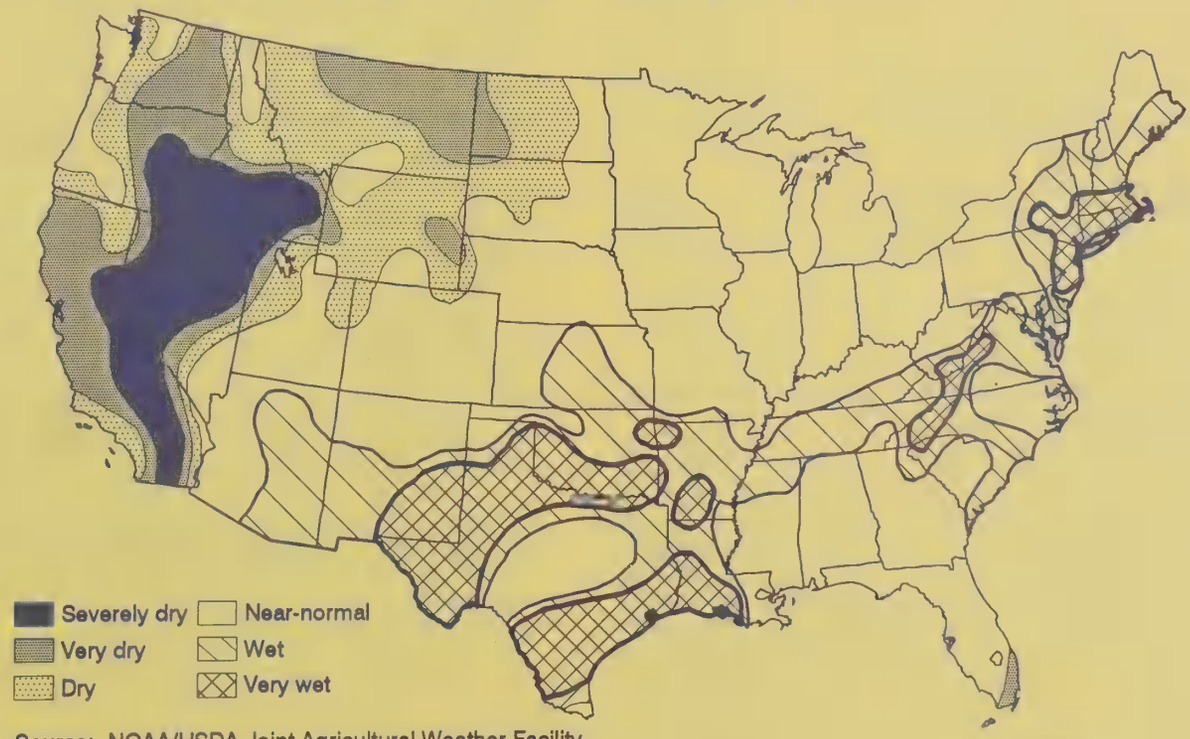
Western Streamflow Forecast for Summer 1992, as of May 1



Source: NOAA/USDA Water Supply Outlook.

Figure 4

Short-term Topsoil Moisture for Crop Production, June 6, 1992



Source: NOAA/USDA Joint Agricultural Weather Facility

Water Supply Outlook and Farm Response

Water supply outlook is an important factor affecting farm production decisions. In rainfed production regions, crop selection, acreage planted, tillage operations, seeding rates, and other management decisions are based on early-season soil moisture levels. Under irrigated production, anticipated water supplies at the beginning of the year may influence the number of acres irrigated, and the timing and quantity of water applications.

Drought conditions can severely impact both agriculture and the environment, particularly in multiyear drought areas. Low subsoil moisture increases the risk of poor germination, yield loss, and crop failure, as dependency on amount and timeliness of seasonal rains increases. Forest growth suffers, and seedlings and mature trees may die from moisture deficiency and increased disease susceptibility. Wildlife also suffers from decreased food stocks, loss of cover, and less available water. Range, brush, and forest fires are more common and harder to control, with estimates of scorched acreage in the West approaching a half-million through August.

Prolonged drought conditions may also have serious effects on livestock production, as is evident in areas of the Pacific Northwest. As range and pasture conditions deteriorate, purchased livestock feed must replace natural forage. As traditional water supplies for livestock dry up, producers are required to haul water, drill new wells, or relocate herds, further increasing production costs. In some cases, producers are forced to reduce herd size.

Irrigated production regions are generally less affected by drought conditions. Adequate irrigation water supplies to meet soil moisture deficits ensure normal crop production and economic activity in most short duration droughts. However, prolonged drought may impact irrigated production through reduced water storage levels and failure to meet irrigation demands.

Box A

California Drought: Year 6 Prompts Policy Action

Below-normal precipitation paired with poor snow-based runoff assured a sixth drought year for California irrigators. Total available water supplies in 1992 were about the same as last year's seriously short quantities. Projected Sacramento River Basin runoff is among the lowest on record, with only 3 years of lower runoff (1991, 1976, and 1977) over the past 50 years.

Water allocations for irrigation were comparable to last year, with one exception. The California State Water Project (SWP), which normally delivers about 5 percent of the (pre-drought) agricultural water supplies, allocated increased water to irrigators this year--45 percent of normal supplies. Last year, all available SWP water was supplied to urban users, but this accounted for only 20 percent of normal urban deliveries. Urban SWP contractors also received 45 percent of normal this year. Due to the nature of SWP contracts, water allocations are now equal between agricultural and urban contractors as long as water short conditions hold.

The U.S. Bureau of Reclamation's Central Valley Project (CVP), which delivered about 30 percent of agriculture's pre-drought normal supply, provided about the same water levels as last year--25 percent to most contractors--with two exceptions. First, water-right holders whose claims predate Federal water development (about 35 percent of CVP's normal deliveries) received 75 percent of normal supplies, as specified in their contracts. Second, the Friant Unit of the CVP delivered about 44 percent of normal supplies to some water districts from Fresno to Bakersfield, down from 53 percent last year.

Agricultural production, farm net income, and farm-related business activity are all suffering as a result of the drought. Agricultural net returns are expected to decline due to reduced production and increased water costs. Some areas will be especially hard hit, although effects are not likely to be significant outside the local areas. Near-normal production of fruits and vegetables and higher commodity prices for some crops will help mitigate the impacts of lost production.

Producers who normally rely on surface water supplies are responding to cutbacks by increasing groundwater use, shifting irrigation water to higher valued crops, increasing water conservation, and foregoing production on some land. Reduced acreage is expected for some forage and field crops, especially cotton.

California is continuing a market transfer mechanism termed "the drought water bank" to meet high priority urban and agricultural needs. In contrast to last year, the state is now requiring firm commitments from prospective water buyers before purchasing water from willing

Surface Water Supplies for Irrigation Still Limiting in West

Agricultural use of surface water for irrigation occurs predominantly in the arid West, where extensive water storage and conveyance facilities exist. Of approximately 37 million irrigated acres in the 17 western states, roughly 18.5 million acres, or 50 percent, are partially or fully supplied by surface water.

Surface water supplies include both direct stream diversions and releases of stored water to augment natural streamflow. The western reservoir system is carefully regulated to capture and store water (primarily snowpack runoff) during spring high flow periods and wet years. Stored water is distributed during peak seasonal demand and dry years for irrigation, municipal, and instream uses. Early season reservoir levels, prior to releases for irrigation and other uses, provide an indication of water supplies for crop production.

This summer's streamflow forecast is poor--less than 70 percent of average--for most regions of the West (figure 5, page 15). Estimates suggest this year's streamflow is likely to be the worst in the West since 1977 (a severe drought year), and in some basins the worst flow year on record. The National Weather Service and the Soil Conservation Service estimate spring and summer streamflow based on observed snowpack, precipitation, and streamflow data. Summer streamflow forecasts of near- or above-normal in the eleven western states are limited this year to streams rising from the southeastern mountains of New Mexico, Colorado, and Arizona. (Arizona is included based on April forecasts, not reflected in figure 5.) Irrigators relying on direct stream diversions in these river basins should have adequate water supplies.

agricultural producers who have alternative water supplies. This year the water bank is expected to move about 150,000 acre-feet of water (about 35 percent of last year's sales) to agricultural and urban areas with limited alternatives for other water supplies. Due partly to a drop of $100 per acre-foot in the sales price (from $175 to $75 per acre-foot at the Delta), agricultural growers have purchased 67 percent of this year's "banked" water, compared to only 20 percent last year.

Continued water shortages are likely. CVP reservoir carryover going into 1993 is forecast at 2.8 million acre-feet, 15 percent less than this year, and only 35 percent of target carryover levels. While not guaranteeing water shortages next year, low reservoir levels will reduce flexibility of the water delivery system for all water users. At least 2 or 3 years of average precipitation would be required to bring California's reservoirs back to normal levels.

Water shortages affect the entire California economy and environment. Limited runoff and reduced reservoir levels mean less water for hydroelectric power generation, smaller lakes for recreational activities, and reduced instream flows for fish, wildlife habitat, and river-related recreation. The increased cost of generating electricity will affect irrigators pumping groundwater, as well as the general economy. Reduced recreational opportunities will also have broad economic and quality-of-life impacts.

Drought conditions in the West have further intensified pressures to modify policies of the federally-financed, Bureau of Reclamation's Central Valley Project. Several bills have been, or are now being, considered by the U.S. Congress that would change existing policies to ensure water flow quantities for fish and migratory waterfowl, reduce restrictions on water transfers, increase agricultural water prices, and shorten contract lengths. The current bills to modify CVP operations, H.R. 5099 in the House and S. 2016 in the Senate, have passed their respective chambers, The two bills contain substantial differences, however, and the House/Senate Conference Committee's task of resolving the differences will be difficult.

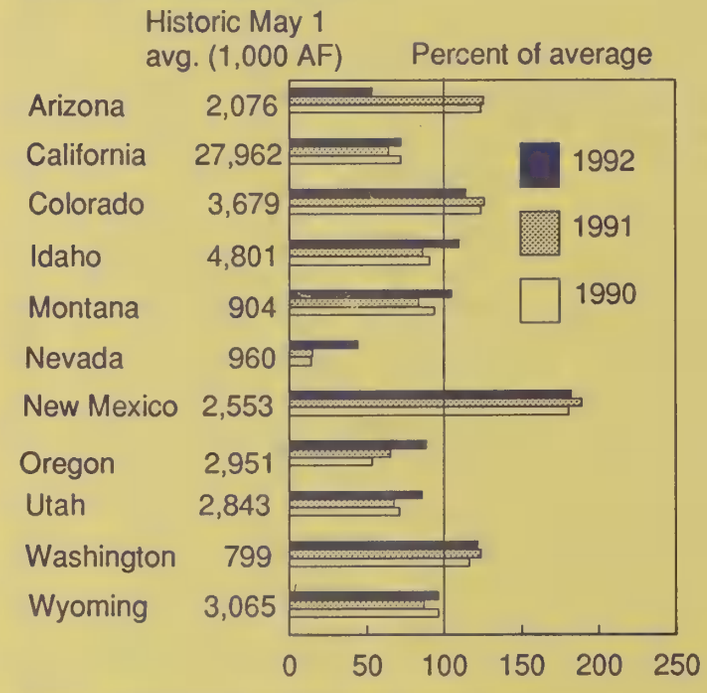
Changes in historic CVP water allocation and pricing policies have significant implications for California agriculture. Since the CVP provides about 30 percent of agricultural water supplies and agriculture accounts for 80 percent of California's water use, any major policy action to increase water supplies for other sectors--urban or environmental--will reduce water supplies now available to agriculture. It seems likely that, on average, agricultural producers will pay higher water prices and receive reduced water allocations, with the most severe allocation reductions occurring in drought years. The extent of change in water prices and allocations remain the key water policy issues for California's agricultural sector.

Reservoir levels in 1992 reflect the effect of multiyear drought and poor streamflow conditions. Above-average storage levels are limited to New Mexico, Arizona, Colorado, and Washington. Acute shortages of stored water were reported in Nevada, where successive years of declining stocks have left reservoirs with only 14 percent of normal levels (figure 6). Oregon reports only 54 percent of normal storage, while Utah and California reservoir levels were at 72 percent of normal. In these four seriously impacted states, Nevada and Oregon storage levels declined from last year, and California and Utah increased slightly. It is unlikely that summer rains will contribute to 1992 stored water reserves, making this winter's snowpack the next chance to refill reservoirs. Idaho, Montana, and Wyoming, while below normal, were within 10 percent of normal at the start of the irrigation season.

Impact of Low Surface Water Supplies

Low levels of projected streamflow and reservoir storage will limit surface water supplies for irrigation in several Western regions, including California (See box A). Irrigators may adjust to short-term reductions in water deliveries in various ways, including: substitution of more expensive (and potentially lower quality) groundwater, reductions in acreage planted to intensive water using crops, reductions in total acres irrigated, partial irrigation applications, and increased water-use efficiency with improved system management. Impacts will be greatest on lower-valued forage and field crops, and generally smallest on higher-valued, specialty crops. Actual impacts will vary by producer, depending primarily on the availability and cost of groundwater and surface water supplies from emergency sources.

Figure 6
Surface Water Storage Conditions for Western States, May 1



Source: USDA/SCS Central Forecast System and California Department of Water Resources.

Hydroelectric power generation will be reduced due to below-normal reservoir levels in the Snake, California, and Missouri river systems. At the same time, power demands are likely to increase as irrigators substitute pumped groundwater for surface water. Electricity costs will rise for irrigators and other consumers, where hydroelectric power is replaced by higher-priced thermoelectric sources. In California, electric power cost increases due to substitution of thermoelectric for hydroelectric power are approaching $3 billion over the 1987-1991 drought period.

Below-normal water storage levels will shorten the barge season on the Missouri River for the third consecutive year. The ten large reservoirs in Montana, North Dakota, and South Dakota, which are managed primarily for downstream river transport, were 17 percent below normal on May 1. (Large, mainstem reservoirs managed for navigation are not included in figure 6). Barges are used as a low-cost means to transport fertilizers, grains, and other bulk items used or produced by agriculture. Barge traffic on the Missouri moved 688,000 tons of grain and soybeans in 1988.

The effects of the drought in California would be much more serious if not for imported Colorado River water. Major reservoirs on the Colorado River (Lake Mohave, Lake Mead, and Lake Powell) and major tributaries, the Green River (Flaming Gorge and Fontenelle Reservoirs), the San Juan River (Navajo Reservoir), and the Gunnison River (Blue Mesa Reservoir), normally contain about 42 million acre-feet of water on May 1. The water stored in these reservoirs is used primarily for instream uses (power generation and recreation), withdrawal uses in Arizona and California (agricultural and urban), and for meeting international legal obligations to Mexico. Water levels in these seven major reservoirs were near-normal for May 1, although declining from above-average levels due to several years of poor snowpack runoff. While water shortages are not imminent, water storage in the Colorado Basin is an area of potential concern.

Recreation is an important source of revenue for many western communities, and continued reductions in surface water supplies are likely to have serious consequences for state and local economies. Recreation interests most directly affected by declining water storage levels include sport fishing, lake and downstream white-water boating, and waterfront service accommodations. Federal policies relating to water may affect local recreational opportunities. This summer's draining of the reservoirs behind New Melones and Folsom Dams in

California to provide temperature control for spawning salmon, significantly reduced recreation opportunities in those areas. Meanwhile, in the Northern Plains, the debate continues over whether Missouri River Basin reservoir management should provide more water for recreation use and perhaps less for navigation.

Reduced surface water supplies are also likely to have significant consequences for wildlife habitat. In some locations, environmental interests are pressing for minimum flow requirements sufficient to maintain stream-related habitats. In California, and in Congress, management of the federally-financed Central Valley Project is under review. At stake is how much water will be diverted from present agricultural uses to flows for fish, waterfowl, and wildlife. Pending legislation would shift an unknown but significant quantity of water (prior versions of the legislation targeted 20-30 percent of normal deliveries) to fish, waterfowl, and wildlife uses. In Nevada's Stillwater National Wildlife Refuge, a private conservation organization's purchase of water rights to ensure minimum flows during low-flow years, provides an example of market transfers to meet environmental objectives.

Perhaps nowhere in the West is the debate over environmental impacts of traditional river allocations more pitched than in the Columbia-Snake River Basin of the Pacific Northwest. Wild salmon populations in the region have declined dramatically as a result of hydropower-related structural and velocity flow restrictions, upstream habitat loss, overharvesting, disease, predation and other factors. Recent listing of several salmon subspecies as threatened or endangered under the Endangered Species Act has prompted federal, state and public-interest groups to press more vigorously for a reallocation of river flows. The specter of significantly reduced supplies due to prolonged drought in the Northwest further intensifies pressures on salmon recovery, and may lead to further restrictions on water supplies for irrigation and other uses.

Groundwater Pumping Fills Gap, Somewhat

As surface water supplies become limited due to policy restrictions or climatic conditions, irrigators tend to increase use of groundwater where available. Many groundwater aquifers are hydrologically linked to surface water resources, and serve as an equalizing reserve. These aquifers can be pumped when surface water is short and refilled as surface water is available. Extended heavy pumping can result in reduced river flows, as in the case of the Pecos River in New Mexico. New Mexico is retiring agricultural land in order to reduce groundwater pumping, which will help to increase Pecos River flows into Texas to meet interstate commitments.

Groundwater overdraft occurs where withdrawals from an aquifer (not linked to a river's flow) exceeds its natural recharge, resulting in a decline in water tables. Declining water tables contribute to rising pumping costs. In the extreme case, overdrafting may cause increased well costs, land subsidence, saltwater intrusion, and early economic exhaustion of common property groundwater reserves.

Effects of a single drought year on western groundwater reserves are likely to be limited, as irrigation supplies generally come from large aquifers that cannot be exhausted over several dry years. However, the current extended drought is increasing the quantity of water pumped for irrigation and other purposes. Expanded pumping has accelerated the rate of groundwater overdraft in several locations, including California's San Joaquin and Salinas Valleys.

Water Supply Outlook

Moisture conditions turned favorable over much of the East by midsummer. However, cool weather has resulted in lagging crop development in some areas. Depending on timing, an early freeze could prevent crop maturity with resulting yield losses.

California, the Great Basin, the Pacific Northwest, the Northern Mountain region, and portions of the Northern Plains are in a continuing drought. Much below-normal summer streamflow is expected for most of the West, severely reducing water supplies for irrigators who divert streamflow. Moreover, water storage in reservoirs supplying irrigation was less than 75 percent of normal in four states heavily dependent on irrigation--Nevada, Oregon, Utah, and California.

As areas of the West face their fifth and sixth drought year, restrictions on water use will become more commonplace. Declining reservoir storage levels will increase competition among municipal, recreation, and environmental interests, and challenge the more traditional reservoir management priorities of irrigation, power generation, and navigation. Restrictions on irrigation water supplies will force changes in traditional irrigation practices and increased reliance on groundwater reserves.

The continued short-term pressures on the water storage and delivery system are rapidly becoming a long term problem. In many areas of the West, several years of "normal" precipitation will be required to replenish water storage to near-normal levels. Pressure for water conservation and structural adjustment of the western water allocation system is likely to continue, if not increase, over the foreseeable future.

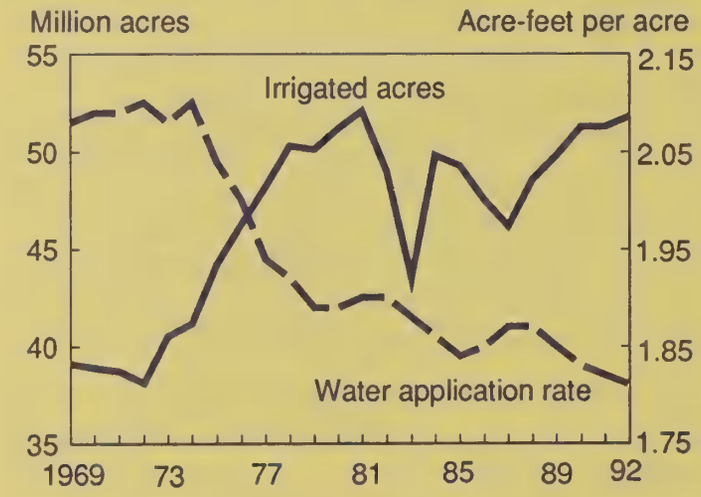
Irrigated Acreage Expands, Application Rates Fall

Irrigated land in farms is estimated to be about 52.1 million acres this year (See table 8), up 600 thousand from last year and edging out the 1981 record (figure 7). Increases came from a reduction in annual program crop set asides and continuing development of irrigation in eastern States. Irriga-

tion increased in all regions except the Pacific Coast and Mountain States where drought has significantly affected surface water supplies.

The Census of Agriculture, taken approximately every 5 years, provides the most reliable estimate of irrigated acreage and the reference base for ERS estimates of irrigated acreage in non-census years. Annual crop acreage estimates and, where available, irrigation estimates from the National Agricultural Statistics Service are used to interpolate between census years. Over the next year, the Bureau of Census will conduct the 1992 Census of Agriculture and, as results are available, ERS irrigated acreage estimates will be revised. The 1992 census is expected to report more irrigated farmland than any previous Census.

Figure 7
Irrigated Land in Farms and Water Use



Average Water Use Per Acre Declines

This publication marks the addition of annual, irrigation-water use estimates (See table 9) to complement the area estimates and to indicate trends in agriculture's impact on water resources. These water use estimates require some cautionary explanation. Crop water application rates published by the Bureau of Census are used to construct annual estimates of irrigation water applied on farms. The 1969 and 1974 censuses reported total water use for all states, whereas the 1984 and 1988 Farm and Ranch Irrigation Surveys (FRIS) estimated application rates by crop for major irrigation states. The 1979 FRIS is a hybrid, having collected whole-farm water use data but reported results by crop specialty. Linear interpolations of each state's crop application rates are used to develop estimates for other years. Year-to-year variations in application rates caused by weather, prices, surface water supplies, and other factors are not reflected in these interpolations. Consequently, the water use estimates for the 5 years reported by the Bureau of Census may be considered more reliable. The interpolated application rates, along with annual estimates of irrigated crop acreage, are used to develop annual estimates of total water use.

The average rate of water application per acre irrigated has trended downward in response to improved irrigation efficiencies; shifts to crops that require less water; and the general irrigation shift to the north, with cooler growing seasons, and to the east, with wetter conditions. The geographic shift was especially pronounced in the expansionary period of 1974-78 when irrigated areas in the East doubled while the West showed more modest increases.

Rates of application are highest in southwestern States, with Arizona applying more than 4 feet on average; and lowest in the Northeast, Lake States, Corn Belt, and Appalachian

Table 8--Irrigated land in farms, 1969-92, by region

Region	1969 1/	1974 1/	1979 2/	1984 2/	1987 1/	1988 2/	1989 2/	1990 2/	1991 3/	1992 3/
					Million acres					
Northeast, Appalachian, & Southeast	1.8	2.0	2.9	3.0	3.0	3.1	3.2	3.3	3.5	3.6
Lake States & Corn Belt	0.5	0.6	1.5	1.9	2.0	2.2	2.3	2.2	2.4	2.6
Northern Plains	4.6	6.2	9.0	9.6	8.7	9.1	9.7	9.9	10.3	10.5
Delta States	1.9	1.8	2.4	3.3	3.7	4.2	4.2	4.5	4.7	5.0
Southern Plains	7.4	7.1	7.3	6.1	4.7	5.2	5.3	5.7	5.2	5.3
Mountain	12.8	12.7	14.7	14.0	13.3	13.6	14.0	14.3	14.2	14.1
Pacific	10.0	10.5	12.2	11.7	10.8	11.1	11.1	11.4	11.0	10.8
United States 4/	39.1	41.2	50.3	49.8	46.4	48.7	50.0	51.4	51.5	52.1
					Million hectares					
Northeast, Appalachian, & Southeast	0.7	0.8	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.5
Lake States & Corn Belt	0.2	0.2	0.6	0.8	0.8	0.9	0.9	0.9	1.0	1.1
Northern Plains	1.9	2.5	3.6	3.9	3.5	3.7	3.9	4.0	4.2	4.2
Delta States	0.8	0.7	1.0	1.3	1.5	1.7	1.7	1.8	1.9	2.0
Southern Plains	3.0	2.9	3.0	2.5	1.9	2.1	2.1	2.3	2.1	2.1
Mountain	5.2	5.1	5.9	5.7	5.4	5.5	5.7	5.8	5.7	5.7
Pacific	4.0	4.2	4.9	4.7	4.4	4.5	4.5	4.6	4.5	4.4
United States 4/	15.8	16.7	20.4	20.2	18.8	19.7	20.2	20.8	20.8	21.1

1/ Census of Agriculture. 2/ Revised estimates constructed from several unpublished USDA sources and the Census of Agriculture. 3/ Preliminary estimates. 4/ Includes Alaska and Hawaii.

States where, averaged across crops, less than 1 foot is applied annually. Eastern states and states at higher latitudes tend to use less water per acre. A notable exception is the 3 feet applied in Massachusetts where most is used in cranberry production. Cranberry farmers typically flood their bogs for harvest and other operations. Rice production annually requires 4 feet, or more, of water and average rates in Delta States and other rice producing regions can be heavily influenced by the rice program. Since 1969, application rates have increased in eastern regions while declining in most of the western and plains states.

With rapid expansion in acreage and increases in application rates, the Northern Plains and other eastern states have increased total water volume applied for irrigation from 10 million acre-feet (maf) in 1969 to 26 million acre-feet currently. Irrigation water use declined by 25 percent in the Southern Plains where area irrigated has declined substantially and increased by 10 percent in the Pacific Coast States where both area irrigated and application rates have increased. In the Mountain region, water use dropped about 10 percent as irrigation shifted north.

Growing Impact of Western Drought on Irrigation

The southwest drought has become the western drought. Forecasts of below normal streamflow have extended to the northern Rockies and Pacific Northwest. Lower set-aside requirements under the 1992 Acreage Reduction Program further increased pressure on tight water supplies as idled acreage was brought back into production. However because of water conservation efforts and the shift in the mix of crops grown in 1992, California's area irrigated and water use remained about the same as in 1991. The 1988-92 cumulative drought impact on California's irrigated crops is estimated to be only a 900,000 acre decrease as substantial use of ground water and conservation has kept most irrigated acreage in production. California's set-aside area this year is down about 400,000 acres from 1988 and preliminary estimates indicate that irrigated land is down about 500,000 acres from 1988.

California continues to use about one-fourth of all irrigation water applied in the nation. The estimated 23 maf is down from 27 maf in 1981 and 25 maf in 1988. California's average application rate, adjusted for changes in the crop mix since 1988, is only about 1 percent less than in 1988. There has not been a significant shift from water-intensive crops to crops that use less water. California farmers are conserving water by reducing area irrigated.

Faced with water constraints, farmers look at how much each acre-foot of water returns in profit when deciding which crops to continue irrigating. The crops with high return to water can include water intensive crops such as fruits and vegetables or, even, rice. ERS estimates of water application rates since 1988 account for only the effects of acreage shifts between crops and between states and ignore possible water conservation in application rates for individual crops. An update on application rates for individual crops will be provided by the next Farm and Ranch Irrigation Survey, a 1993 follow-on survey of farmers reporting irrigation in the 1992 census.

Other western states are also showing decreases in area irrigated in spite of less idling of program crops. Estimates of irrigated area for Nevada, Arizona, Utah, and Colorado are, in aggregate, about 500,000 acres below 1988 levels while annual idled acreage is down about 1 million acres. The drought has expanded to the Pacific Northwest where pre-

Table 9--Average depth and volume of irrigation water applied on farms, 1969-92, by region

Region	1969 1/	1974 1/	1979 2/	1984 2/	1987 3/	1988 2/	1989 3/	1990 3/	1991 3/	1992 3/
	Depth (feet)									
Northeast, Appalachian, & Southeast	0.69	0.95	1.26	1.37	1.31	1.26	1.25	1.23	1.22	1.22
Lake States & Corn Belt	0.57	0.66	0.80	0.77	0.83	0.85	0.84	0.84	0.84	0.85
Northern Plains	1.37	1.45	1.29	1.14	1.18	1.19	1.19	1.19	1.19	1.19
Delta States	1.30	1.49	2.15	1.47	1.41	1.48	1.43	1.43	1.43	1.44
Southern Plains	1.41	1.50	1.43	1.39	1.41	1.43	1.44	1.40	1.42	1.43
Mountain	2.48	2.36	1.99	2.05	2.05	2.07	2.07	2.05	2.06	2.05
Pacific	2.76	2.92	2.67	2.81	2.84	2.87	2.83	2.81	2.81	2.82
United States 4/	2.08	2.10	1.89	1.86	1.87	1.87	1.85	1.83	1.82	1.81
	Volume (million acre-feet)									
Northeast, Appalachian, & Southeast	1.2	1.9	3.7	4.1	4.0	3.9	4.0	4.1	4.2	4.4
Lake States & Corn Belt	0.3	0.4	1.2	1.5	1.6	1.9	2.0	1.8	2.1	2.2
Northern Plains	6.3	9.0	11.7	11.0	10.3	10.8	11.5	11.7	12.2	12.5
Delta States	2.4	2.7	5.2	4.9	5.2	6.3	6.0	6.5	6.7	7.1
Southern Plains	10.5	10.7	10.5	8.6	6.7	7.5	7.7	8.0	7.4	7.6
Mountain	31.8	30.0	29.2	28.8	27.3	28.1	28.8	29.3	29.3	29.0
Pacific	27.3	30.7	32.5	32.9	30.6	31.7	31.4	31.9	30.9	30.6
United States 4/	81.1	86.3	94.9	92.6	86.7	91.7	92.3	94.3	93.7	94.3

1/ Census of Agriculture. 2/ Estimates constructed from the Farm and Ranch Irrigation Survey estimates of application rates and ERS estimates of irrigated acreage. 3/ Estimates constructed by interpolating State/crop application rates between FRIS years and accounting for area changes in crop irrigation. State crop application rates since 1988 are assumed to be unchanged. 4/ Includes Alaska and Hawaii.

liminary estimates show irrigation down as much as 400,000 acres from the 1990 level.

Nationally, the primary determinants of year-to-year changes in area irrigated continue to be the longrun trend of technology adoption and the effects of commodity programs. For 1992, the acreage idled under annual programs is down about 10 million acres. Most of this reduction in idle land occurred with the wheat program, of which less than 10 percent is irrigated. With additional declines in rice and corn idled acreage and some increase in cotton idled acreage, the net effect of commodity programs is estimated to have increased irrigation by 1 to 1.5 million acres. Area flexed out of program crops in 1992 is about the same as in 1991. The CRP has minimal effect on irrigation. With the background trend of irrigation development running at about one-third of a million acres per year, the normal expectation would have been an increase of about 1.5 million acres. With only a 600,000 acre increase estimated, the difference is primarily due to the cumulative impact of the western drought.

Irrigation Outlook

The near term U.S. outlook for irrigated land in farms will continue to be driven primarily by annual cropland set-aside programs and the status of far western water supplies. Wheat ARP's announced for the 1993 crop year have dropped to 0 percent from this year's 5 percent. With no change in other program crops and a continuation of the long term upward trend, irrigation could be up another half-million acres in 1993. This could be offset by further tightening of water supplies in the West.

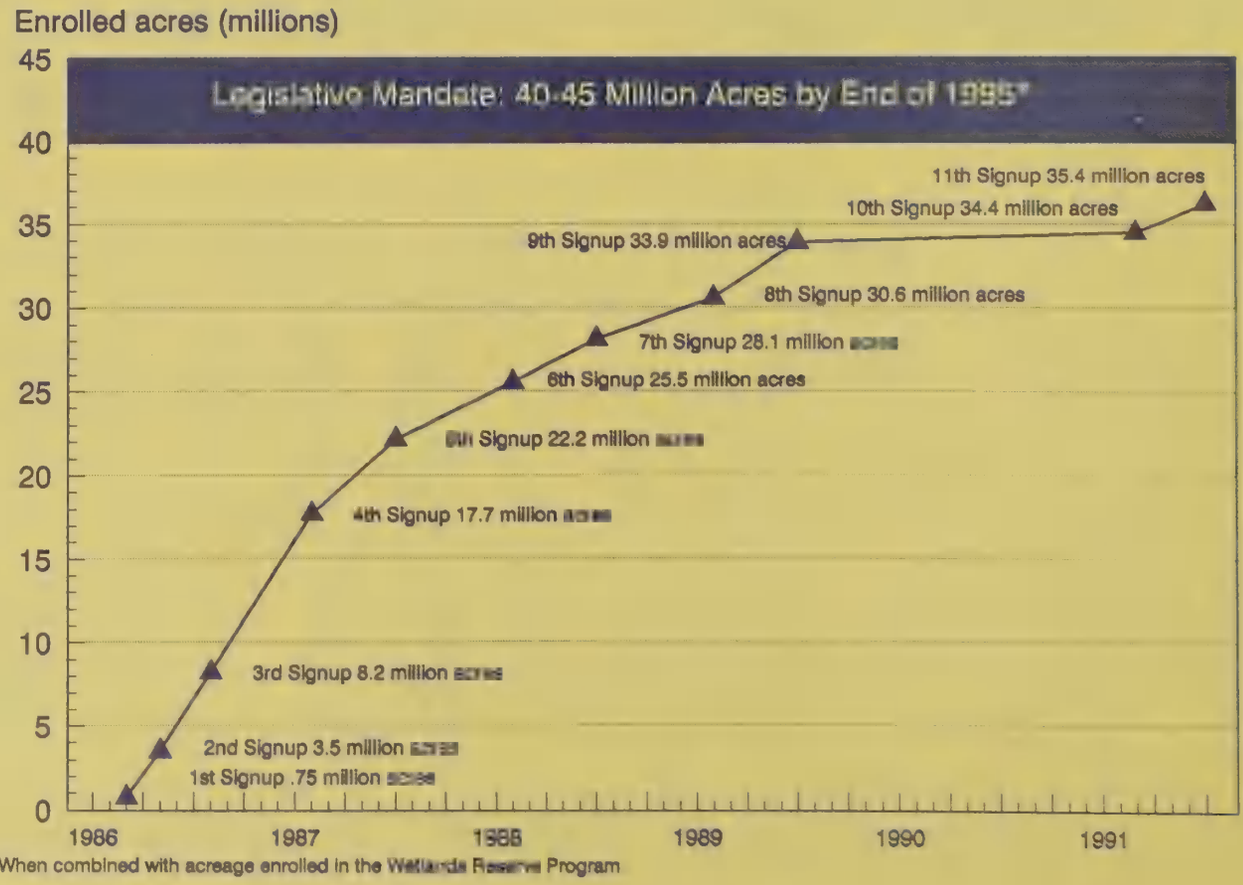
Conservation and Water Quality

CRP Enrollment Continues

Now in its seventh year, the Conservation Reserve Program (CRP) has converted a total of 35.4 million acres of highly erodible or environmentally sensitive cropland to conservation uses (figure 8). Farmers enrolled this land in 11 separate signup periods from March 1986 to July 1991 (table 10). This June, a twelfth signup opportunity was held. Interest by farmers in this most recent signup was high, with nearly 2.6 million acres offered. From this, USDA has tentatively accepted 1.1 million acres for retirement in fiscal year 1993. Congress did not include money for new CRP enrollments in the fiscal year 1993 appropriation. While this will not affect payments on land enrolled in signups 1-12, no new CRP signup opportunities are expected next year.

Figure 8

Cumulative CRP Enrollment



* When combined with acreage enrolled in the Wetlands Reserve Program

Newest Enrollment Favors the East

Although more than half of total CRP acres are located in the Great Plains (figure 9), since passage of the Food, Agriculture, Conservation and Trade Act of 1990, new enrollment has shifted more to the midwest and eastern states (table 11). This is a result of the significantly redesigned bid acceptance process and new eligibility criteria highlighted in last year's Cropland, Water, and Conservation Situation and Outlook. New USDA program rules for CRP operation place greater emphasis on water quality improvement and on selecting acres to obtain the greatest conservation and environmental benefits per dollar spent.

In the tenth signup, held in March 1991, a total of 475,000 new acres were contracted. In the eleventh signup, held in July 1991, another 998,000 acres were contracted. Of these acres 31 percent were located in the Northern Plains, Southern Plains, and Mountain regions. By contrast, in signups 1-9 these regions accounted for 62 percent of enrollment.

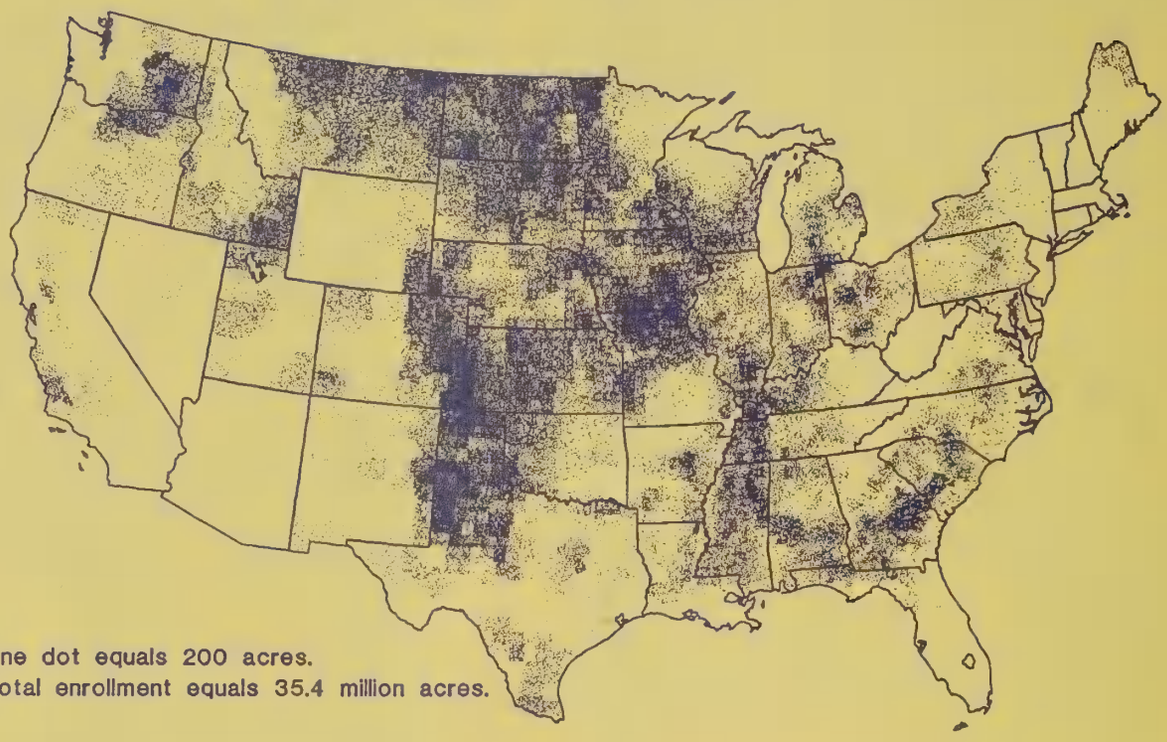
Table 10--Enrollment in the Conservation Reserve Program

Item	Number of contracts	Number of acres	Average rental rate	Average erosion reduction
	1,000	Million	$/acre/year	Tons/acre/year
Signup period:				
#1 March 1986 1/	9.4	0.75	42.06	26
#2 May 1986	21.5	2.77	44.05	27
#3 August 1986 2/	34.0	4.70	46.96	25
#4 February 1987 3/	88.0	9.48	51.19	19
#5 July 1987	43.7	4.44	48.03	17
#6 February 1988 4/	42.7	3.38	47.90	18
#7 July 1988	30.4	2.60	49.71	17
#8 February 1989 5/	28.8	2.46	51.04	14
#9 July-August, 1989	34.8	3.33	50.99	14
#10 March 1991 6/	8.6	0.48	53.66	17
#11 July 1991	14.7	1.00	59.37	15
Total	356.7	35.40	49.29	19
Cumulative enrollment by fiscal year:				
1986	21.0	2.04	43.11	28
1987	145.9	15.71	49.15	23
1988	233.5	24.47	48.52	21
1989	295.4	29.82	48.78	20
1990	333.4	33.92	48.93	19
1991	342.0	34.40	49.00	19
1992	356.7	35.40	49.29	19
	1,000	Million hectares	$/hectare/year	Metric tons per hectare per year
Signup period:				
#1 March 1986 1/	9.4	0.30	103.85	58
#2 May 1986	21.5	1.12	108.77	60
#3 August 1986 2/	34.0	1.90	115.95	56
#4 February 1987 3/	88.0	3.84	126.40	43
#5 July 1987	43.7	1.80	118.59	38
#6 February 1988 4/	42.7	1.37	118.27	40
#7 July 1988	30.4	1.05	122.74	38
#8 February 1989 5/	28.8	1.00	126.02	31
#9 July-August, 1989	34.8	1.35	125.90	31
#10 March 1991 6/	8.6	0.19	132.49	37
#11 July 1991	14.7	0.40	146.59	33
Total	356.7	14.34	121.70	42
Cumulative enrollment by fiscal year:				
1986	21.0	0.83	106.44	63
1987	145.9	6.36	121.36	52
1988	233.5	9.91	119.80	47
1989	295.4	12.08	120.44	45
1990	333.4	13.74	120.81	43
1991	342.0	13.93	120.98	43
1992	356.7	14.34	121.70	42

1/ Eligible acres included cropland in land capability classes II through V eroding at least three times greater than the tolerance rate (see definitions), or any cropland in land capability classes VI through VIII. 2/ Eligible acres expanded to include cropland in land capability classes II through V eroding at least two times the tolerance rate and having gully erosion. 3/ Eligible acres expanded to include cropland eroding above the tolerance rate with an erodibility index of 8 or greater. 4/ Eligible acres expanded to include cropland in land capability classes II through V eroding at least two times the tolerance rate if planted in trees. Eligibility also extended to cropland areas 66 to 99 feet wide adjacent to permanent water bodies for placement in filter strips. 5/ Eligible acres expanded to include cropped wetlands and cropland areas subject to scour erosion. 6/ Eligible acres expanded to include cropland devoted to easement practices, cropland in state water quality areas, cropland in conservation priority areas, cropland within established wellhead protection areas. Farmed wetlands, even if otherwise eligible, were ineligible for enrollment.

Figure 9

Conservation Reserve Program Enrollment, Signup Periods 1-11



One dot equals 200 acres.
Total enrollment equals 35.4 million acres.

Table 11--CRP enrollment, rental payments, and erosion reductions, signups 1-11

Region	Signups 1-9 under 1985 Farm Act: Number of contracts	Total cropland enrolled	Trees planted	Reduced commodity base	Average annual rent payment	Average annual erosion reduction	Signups 10-11 under 1990 Farm Act: Number of contracts	Total cropland enrolled	Trees planted	Reduced commodity base	Average annual rent payment	Average annual erosion reduction
	1,000	Million acres	1,000 acres	Million acres	$/acre	tons/acre	1,000	Million acres	1,000 acres	Million acres	$/acre	tons/acre
Northeast	5.5	0.20	8.9	0.07	59.62	13	0.3	0.01	0.6	0.00	51.76	6
Appalachian	26.0	1.06	139.6	0.53	53.83	26	1.5	0.06	7.6	0.03	53.64	18
Southeast	31.4	1.57	1207.4	0.73	42.60	15	1.5	0.07	51.3	0.04	43.30	12
Delta States	16.3	1.09	625.3	0.43	43.93	19	1.5	0.10	71.5	0.05	45.73	11
Corn Belt	80.1	4.73	62.9	2.65	73.04	18	10.0	0.49	25.3	0.26	77.64	15
Lake States	47.2	2.63	97.2	1.63	58.54	16	4.8	0.22	23.5	0.12	57.55	10
N. Plains	73.4	9.43	8.4	6.48	45.94	15	1.8	0.14	1.3	0.10	48.73	16
S. Plains	26.6	5.08	19.4	4.09	40.19	32	1.0	0.15	3.0	0.12	39.97	27
Mountain	20.3	6.44	4.4	4.02	39.73	19	0.6	0.17	0.3	0.11	39.06	15
Pacific	6.5	1.70	5.7	1.14	49.29	13	0.4	0.06	0.5	0.04	54.75	12
United States	333.4	33.92	2179.3	21.76	48.93	19	23.3	1.47	184.9	0.89	57.53	15
	1,000	Million hectares	1,000 hectares	Million hectares	$/hectare	metric tons per hectare	1,000	Million hectares	1,000 hectares	Million hectares	$/hectare	metric tons per hectare
Northeast	5.5	0.08	3.6	0.03	147.32	29	0.3	0.01	0.2	0.00	127.90	13
Appalachian	26.0	0.43	56.5	0.21	133.01	58	1.5	0.02	3.1	0.01	132.54	41
Southeast	31.4	0.64	489.0	0.30	105.26	34	1.5	0.03	20.8	0.02	106.99	27
Delta States	16.3	0.44	253.2	0.17	108.55	43	1.5	0.04	29.0	0.02	113.00	24
Corn Belt	80.1	1.92	25.5	1.07	180.48	40	10.0	0.20	10.2	0.11	191.85	33
Lake States	47.2	1.07	39.4	0.66	144.65	36	4.8	0.09	9.5	0.05	142.21	23
N. Plains	73.4	3.82	3.4	2.62	113.52	34	1.8	0.06	0.5	0.04	120.41	37
S. Plains	26.6	2.06	7.9	1.66	99.31	72	1.0	0.06	1.2	0.05	98.77	61
Mountain	20.3	2.61	1.8	1.63	98.17	43	0.6	0.07	0.1	0.04	96.52	34
Pacific	6.5	0.69	2.3	0.46	121.80	29	0.4	0.02	0.2	0.02	135.29	27
United States	333.4	13.74	882.6	8.81	120.91	43	23.3	0.60	74.9	0.36	142.16	34

More Enrollment in Conservation Priority Areas

More than 195,000 acres, or 13 percent of the combined acreage contracted in the tenth and eleventh signups, came from Conservation Priority Area watersheds such as the Chesapeake Bay, Long Island Sound, and the Great Lakes region. According to the 1990 Farm Act, USDA is to attempt to achieve a significant level of enrollment in these watersheds to maximize water quality and wildlife habitat benefits.

In addition, more than 24,000 acres were accepted in high priority watersheds specifically targeted by USDA to im-

Table 12--CRP land treated by various conservation practices

Practice	Signups 1-9 1985 Farm Act		Signups 10-11 1990 Farm Act	
	Land	Share of land enrolled	Land	Share of land enrolled
	1,000 acres	Percent	1,000 acres	Percent
Grass cover	29,707	87.6	1,258	85.4
Tree cover	2,179	6.4	185	12.5
Wildlife habitats	1,974	5.8	22	1.5
Windbreaks & shelterbelts	7	0.0	1	0.1
Diversions	83	0.2	0	0.0
Erosion, sediment, & water control structures	40	0.1	0	0.0
Grass and sod waterways	15	0.0	1	0.0
Filter strips	49	0.1	3	0.2
Alley cropping	NA 1/		0	0.0
Contour grass strips	NA		0	0.0
Living snow fences	NA		0	0.0
Salt grasses	NA		4	0.3
Total 2/	33,922	100.0	1,473	100.0
	1,000 hectares	Percent	1,000 hectares	Percent
Grass cover	12,031	87.6	509	85.4
Tree planting	882	6.4	75	12.5
Wildlife habitat	799	5.8	9	1.5
Field windbreaks	3	0.0	0	0.1
Diversions	34	0.2	0	0.0
Erosion, sediment, & water control structures	16	0.1	0	0.0
Grass and sod waterways	6	0.0	0	0.0
Filter strips	20	0.1	1	0.2
Alley cropping	NA	0.0	0	0.0
Contour grass strips	NA		0	0.0
Living snow fences	NA		0	0.0
Salt grasses	NA		2	0.3
Total 2/	13,738	100.0	597	100.0

1/ Not available as a practice in Signups 1-9. 2/ Acres where more than one practice was applied are counted only once in the total.

prove water quality in coordination with the President's Water Quality Initiative.

Average Rental Costs Continue To Increase

Annual rental payments received by farmers in the tenth signup averaged $53.66 per acre, while in the eleventh signup they averaged $59.37. These compare with average rents of $48.93 per acre for land enrolled in the first 9 signups.

Farmers indicate a desired rental payment when they offer acres for CRP enrollment. These rent requests are now screened against soil-specific estimates of the rent that could be earned locally on comparable cropland. Bids that exceed this amount, adjusted for other costs the farmer incurs due to CRP participation, are rejected. This, coupled with the competitive nature of the new bid acceptance process, means that farmers cannot predetermine a rent that will guarantee acceptance.

Erosion Reductions To Benefit Water Quality

Annual erosion reductions on land accepted in the tenth and eleventh signups are estimated to average slightly more than 15 tons per acre. Two-thirds of the erosion reduction will be sheet and rill (water-caused) erosion experienced primarily in the East, while the remainder reflects a reduction in wind erosion occurring mainly in the Great Plains. While both forms of erosion can reduce agricultural productivity, reduction of sheet and rill erosion generally produces greater off-site water quality, recreational, and wildlife benefits.

CRP Conservation Practices

Most farmers who enroll cropland in the CRP have a choice of conservation covers. As table 12 indicates, grass cover has been and continues to be the most popular nationally. However, farmers in the Southeast and Delta regions often choose to plant trees. Both the 1985 Food Security Act (FSA) and 1990 Food, Agriculture, Conservation, and Trade Act (FACTA) established goals that one-eighth of enrolled CRP acres should receive tree cover. In the first nine signups under the 1985 FSA, actual tree planting rates fell short of this goal when only 6.4 percent of the enrolled acres were planted with trees. However, in the tenth and eleventh signups, tree planting will average 12.5 percent.

Practices such as filter strips, wildlife habitat improvement, salt-tolerant grasses, field windbreaks, grassed waterways, contour grass strips, shelterbelts, and living snow fences typi-

cally involve a limited number of acres but provide significant environmental benefits. For this reason the 1990 FACTA called for these practices to be subject to useful-life easements of 15 or 30 years. The easements, which attach to land records, require farmers to maintain the practices for their useful life although CRP rental payments are made for only the first 10 years.

While bids containing these practices were given special priority for acceptance in the new bid evaluation process, due to the easement requirement the number of acres offered by farmers declined sharply. For example, for the first time since they were made eligible for CRP enrollment, very few filter strip acres were offered by farmers in the eleventh signup. To once again make such practices attractive to farmers, Congress recently passed and the President signed legislation that removed the easement requirement.

Concern over Future of CRP

At the end of the CRP contract period, annual rental payments made by USDA to CRP participants will cease. At that point, farmers are under no further obligation to maintain the grass or trees on their CRP acres. Concern is building over the amount of CRP land that could return to crop production, and the accompanying loss of environmental benefits, especially if prices and/or commodity programs are favorable when CRP contracts expire. As table 13 shows, the first CRP contracts will begin to expire in 1996, with the bulk of the land coming out of contract in 1997 and 1998.

In 1990, a national survey of CRP farm owners and operators was conducted by the Soil and Water Conservation Society (SWCS). According to that survey, farmers intended to return approximately 53 percent of CRP acres to crop production. The next highest use was keeping CRP acres in grass for livestock forage which would account for 23 percent of CRP acres.

Planned uses varied widely by region. In the Pacific and Lake State regions, for example, farmers planned to return 85 percent and 73 percent, respectively, of their CRP acres to crop production. In the Southeast and Delta regions, farmers intended to retain approximately 60 percent of CRP acres in tree cover.

While the SWCS survey provides an idea of what CRP farmers were thinking in 1990, recent analysis indicates that the amount of CRP land ultimately returned to crop production may be different. Factors that could cause more or less CRP land to return to crop production include demand changes for U.S. agricultural commodities resulting from trade agreements, demand from the eastern European countries and the Commonwealth of Independent States, modifications of U.S. commodity programs including those in the 1990 FACTA, and potential programs for continued protection of CRP acres.

While specific legislation for dealing with expiring CRP contracts may wait until the 1995 Farm Bill debate, Congress set the stage for dealing with expiring CRP contracts in the 1990 FACTA by providing USDA with a range of approaches. The Act requires the Secretary of Agriculture to extend, for as long as appropriate, the protection of crop acreage bases, quotas, and allotments on conservation reserve lands after the contracts expire if the owner or operator will continue the land in appropriate conserving uses. No additional cost-shares or rental payments would be made to the owner or operator, but haying and grazing may be permitted during specified periods.

Table 13--Land leaving CRP when contracts end

First year CRP land is no longer under contract	Land leaving CRP
	1,000 acres
1996	2,043
1997	13,670
1998	8,756
1999	5,355
2000	4,098
2001	426
2002	985
Total	35,333
	1,000 hectares
1996	827
1997	5,536
1998	3,546
1999	2,169
2000	1,660
2001	173
2002	399
Total	14,310

Table 14--Cropland offered for enrollment in trial Wetland Reserve Program, June 1992

State	Cropland offered	Intentions to participate
	Acres	Number
California	85,000	160
Iowa	45,000	750
Louisiana	119,000	420
Minnesota	33,000	250
Missouri	29,000	300
Mississippi	115,000	470
New York	2,000	60
North Carolina	25,000	70
Wisconsin	13,000	250
Total	466,000	2,730
	Hectares	Number
California	34,400	160
Iowa	18,200	750
Louisiana	48,200	420
Minnesota	13,400	250
Missouri	11,700	300
Mississippi	46,600	470
New York	800	60
North Carolina	10,100	70
Wisconsin	5,300	250
Total	188,700	2,730

The 1990 FACTA also grants USDA authority to extend CRP contracts up to 10 years and/or purchase long-term or permanent easements through the Environmental Easement Program on non-tree CRP land that poses an environmental threat and is likely to return to crop production upon contract expiration. USDA is now considering strategies for continued protection of post-contract CRP land.

Progress on Wetland Protection and Restoration

In addition to amending existing conservation programs, the 1990 FACTA created several new programs. One newly created program was the Wetlands Reserve Program (WRP).

In July, USDA conducted the first signup opportunity under a pilot WRP involving 9 states. Farmer interest in the program exceeded even the most optimistic expectations. Preliminary results indicate that some 2,730 intentions to participate were submitted for 466,000 acres for enrollment in the program (table 14). From this, USDA is expected to accept 50,000 acres at a cost of $46.4 million. Owners of accepted acreage will receive an easement payment (10 equal annual payments or one lump sum) plus 75 percent of the costs for restoring the land to healthy wetland conditions.

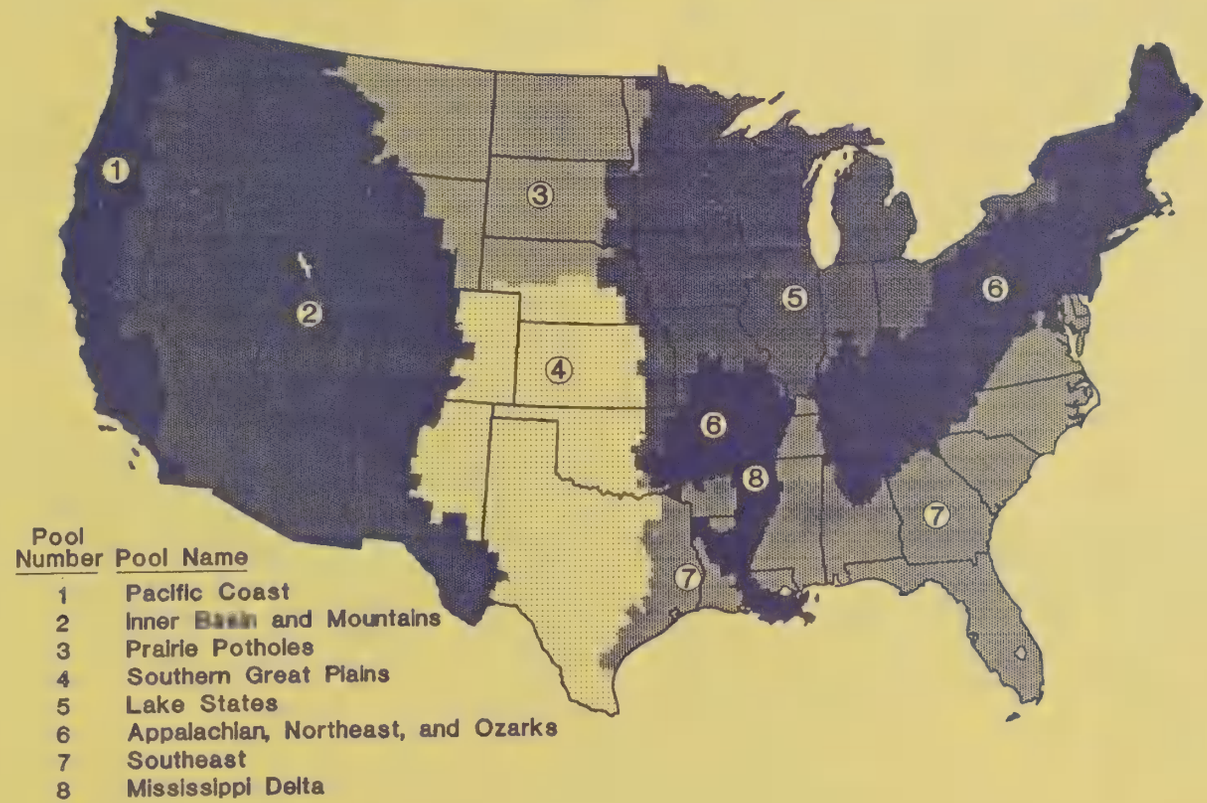
Qualifying Lands

Lands eligible for WRP include restorable farmed wetlands which were converted to cropland prior to December 23, 1985, and functionally related wetlands, uplands, and riparian areas. In addition the farmed wetlands must have been planted to an agricultural commodity for at least one of the 1986-1990 crop years and must be capable of being restored to wetland.

The Bid Pool Process

Farmers who are interested in enrolling land in the WRP must file an intention to participate during an announced enrollment period. Within 60 days of the close of the enrollment period, the landowner, SCS, and the U.S. Fish and Wildlife Service complete a Wetlands Reserve Plan of Operation (WRPO). Eight bid pools were established for the U.S. (figure 10). The total target acreage for an enrollment period is divided between the bid pools, based on the relative amount of cropland on hydric soils in each. Target acreage not used in a pool may be redistributed among the other pools. Bids are evaluated for acceptance based on a number of factors relating to the feasibility and desirability of successful restoration.

Figure 10
Wetland Reserve Program Regional Bid Pools



Pool Number	Pool Name
1	Pacific Coast
2	Inner Basin and Mountains
3	Prairie Potholes
4	Southern Great Plains
5	Lake States
6	Appalachian, Northeast, and Ozarks
7	Southeast
8	Mississippi Delta

Box B:

USDA Conservation and Water Quality Programs

Activities in Support of the President's Water Quality Initiative

- **Expanded Education and Technical Assistance** is directed to selected demonstration projects, hydrologic unit areas, and special water quality projects to accelerate the adoption of water quality protection practices by farmers.

- **Special Research and Development** efforts are aimed at developing and identifying technology and production systems that reduce the environmental impacts of agricultural chemical use.

- **New Database Development and Evaluation** activities include collection and analysis of survey data from farmers on pesticide and nutrient use on major crops in conjunction with current farming practices, and analysis of the economic and environmental impacts of implementing water quality practices and programs.

1985 and 1990 Farm Bill Provisions

- **Conservation Reserve Program** (CRP) is designed to voluntarily retire from crop production about 40 million acres of highly erodible or environmentally sensitive cropland for 10-15 years. In exchange, participating producers receive annual rental payments up to $50,000 and 50 percent cost share assistance for establishing vegetative cover on the land.

- **Conservation compliance provision** requires farmers with highly erodible cropland to fully implement an approved conservation plan by January 1, 1995 to maintain eligibility for USDA program benefits.

- **Sodbuster provision** requires that, in order to be eligible for USDA program benefits, farmers who convert highly erodible land to commodity production must have an approved conservation system.

- **Swampbuster provision** states that farmers who convert wetlands for, or to make possible, the production of an agricultural commodity are ineligible for USDA program benefits, unless there is a USDA determination that conversion would have only a minimal effect on wetland hydrology and biology.

- **Wetlands Reserve Program** (WRP) provides payments and cost sharing to farmers who agree to return farmed or converted wetland back into a wetland environment on a permanent or long-term basis. Payments cannot exceed the fair market value of the land less the value of permitted uses, such as hunting, fishing, managed timber harvest, or periodic haying and grazing. Up to 1 million acres may be enrolled in the program by 1995.

- **Agricultural Water Quality Protection Program** provides annual incentive payments up to $3,500 per year for 3-5 years to farmers who implement a USDA approved water quality protection plan and submit an annual report on plan activities. Currently being carried out as part of the Agricultural Conservation Program (ACP) as Water Quality Incentive Projects (WQIP).

- **Environmental Easement Program** provision provides annual payments for up to 10 years and up to 100 percent cost sharing to farmers who agree to deed restrictions which provide longterm protection to environmentally sensitive land. Annual payments cannot exceed $50,000 and can total no more than $250,000 per farmer. No implementation has occurred to date.

Continuing Assistance Programs

- **Agricultural Conservation Program** (ACP), initiated in 1936, provides financial assistance up to $3,500 annually or $10,500 over 3 years to farmers who carry out approved conservation and environmental protection practices on agricultural land.

- **Conservation Technical Assistance** (CTA), initiated in 1936, provides technical assistance by the Soil Conservation Service (SCS) through Conservation Districts to farmers for planning and implementing soil and water conservation and water quality practices.

- **Small Watershed Program** (PL-566), initiated in 1954, assists local organizations in flood prevention, watershed protection, and water management. Part of this effort involves establishment of measures to reduce erosion, sedimentation, and runoff.

- **Great Plains Conservation Program** (GPCP), initiated in 1957, provides technical and financial assistance in Great Plains States for conservation treatment on entire operating units. Financial cost-share assistance limited to $35,000 per farmer contract.

- **Resource Conservation and Development Program** (RC&D), initiated in 1962, assists multi-county areas in enhancing conservation, water quality, wildlife habitat, recreation, and rural development.

- **Water Bank Program,** initiated in 1970, provides annual payments for preserving wetlands in important migratory waterfowl nesting, breeding, or feeding areas.

- **Forestry Incentives Program**, initiated in 1972, provides cost-sharing up to 65 percent for tree planting and timber stand improvement for private forest lands of no more than 1,000 acres.

- **Emergency Conservation Program**, initiated in 1978, provides financial assistance to farmers in rehabilitating cropland damaged by natural disasters.

- **Rural Clean Water Program** (RCWP), initiated in 1980 and scheduled to end in 1995, is an experimental program that has been implemented in 21 selected areas. It provides cost-sharing and technical assistance to farmers who voluntarily implement approved best management practices to improve water quality. Cost-share payments are limited to $50,000 per farm.

- **Colorado River Basin Salinity Control Program** (CRBSC), initiated in 1974 and amended in 1984, established a voluntary onfarm cooperative salinity control program within the USDA, and provides cost-sharing and technical assistance to farmers to improve the management of irrigated lands so as to reduce the amount of salt entering the Colorado River.

- **Farmers Home Administration Loan Program** (FmHA) provides loans to farmers and associations of farmers for soil and water conservation, pollution abatement, and building or improving water systems that serve several farms. May acquire 50-year conservation easements as a means of helping farmers reduce outstanding loan amounts.

Research and Extension Activities

- **Agricultural Research Service** (ARS) conducts research on new and alternative crops and agricultural technology to reduce agriculture's adverse impacts on soil and water resources.

- **Cooperative State Research Service** (CSRS) coordinates conservation and water quality research conducted by State Agricultural Experiment Stations and land grant universities. This agency allocates and administers funds appropriated for special and competitive grants for water quality research.

- **Economic Research Service** (ERS) estimates economic impacts of existing and alternative policies, programs, and technology for preserving and improving soil and water quality. With National Agricultural Statistics Service, collects data on farm chemical use, agricultural practices, and costs and returns.

- **Forest Service** (FS) conducts research on environmental and economic impacts of alternative forest management policies, programs, and practices.

Extension Service (ES) provides information and recommendations on soil conservation and water quality practices to land owners and operators in cooperation with the State Extension Service and state and local offices of USDA agencies and Conservation Districts.

Landowner and Government Share Responsibilities

The Agricultural Stabilization and Conservation Service (ASCS) will consider all costs of obtaining easements based on their assessment of future food needs and benefits to wildlife as well as wetland restoration costs. Easement payments can not exceed fair market value of the land less the value of the land encumbered by the easement. Selective timber cutting, grazing, and hunting and fishing leases may be allowed in the WRPO, if such activities are not inconsistent with wetland restoration. ASCS will share 75 percent of the costs to the landowner of rehabilitating the wetland under permanent easements and 50 percent of restoration costs for 30-year easements. The landowner will remain responsible for property taxes and reporting WRP payments to the IRS.

Although the overall enrollment goal for the WRP is one million acres by the end of 1995, Congress has decided not to fund additional enrollment under the WRP for fiscal year 1993.

Conservation Compliance and Sodbuster Enforcement

According to the Soil Conservation Service (SCS), conservation compliance plans have been fully implemented on approximately 56 percent of the 140 million acres with plans. Established in the 1985 FSA, conservation compliance required farmers of highly erodible land to obtain an approved conservation plan before 1990, and fully implement the plan before 1995. Failure will cause a farmer to lose some or all eligibility for most farm program benefits. Under the sodbuster provision, farmers who wish to produce an agricultural commodity on highly erodible land not in production during 1981-85, must obtain and fully apply an approved conservation plan or lose eligibility for most farm program benefits. Land subject to the sodbuster provision is estimated at 224 million acres nationwide, and constitutes about 25 percent of all land in farms.

In addition to meeting the 1995 deadline, conservation compliance also requires that farmers of highly erodible land actively apply their plans making progress in the interim. To check for noncompliance, SCS annually conducts status reviews on a random 5 percent of plans. Producers not meeting their plan on schedule lose eligibility for farm program benefits.

In 1991, SCS conducted status reviews on 71,000 conservation plans. Because of differing time frames and procedural problems, instances of noncompliance identified by state SCS offices were more numerous than those identified by local field offices. The State reviews estimated that the rate of farmers not actively applying their conservation plan ranged from 3.6 to 4.6 percent. While the SCS status reviews show low rates of noncompliance, studies by USDA's Office of Inspector General (OIG) and the Soil and Water Conservation Society (SWCS) appear to challenge these results.

Table 15 shows ASCS statistics combining conservation compliance and sodbuster violations by participating producers from 1986-1992. While the 1992 figures are not yet final, nationally over this period 779 participating producers were found in violation on a total of 98,500 acres. Total requested benefits denied amounted to nearly $4.7 million. This does not include 312 additional producers who were found in violation and were denied benefits under tobacco and peanut marketing eligibility, for which no denied dollar amount is available, nor does it include violating producers who did not request USDA benefits.

Table 15--Conservation compliance & sodbuster violations 1/

Year	Producers found in violation	Land in violation	Value of benefits denied
	Number	Acres	Dollars
1986	2	10	10,834
1987	27	1,240	224,327
1988	97	2,711	531,062
1989	35	2,180	237,666
1990	203	55,803	1,478,382
1991	372	33,233	1,994,076
1992 2/	43	3,367	193,732
Total	779	98,545	4,670,079
	Number	Hectares	Dollars
1986	2	4	10,834
1987	27	502	224,327
1988	97	1,098	531,062
1989	35	883	237,666
1990	203	22,600	1,478,382
1991	372	13,459	1,994,076
1992	43	1,364	193,732
Total	779	39,911	4,670,079

1/ Source: ASCS. 2/ Figures for 1992 are not final.

Table 16--Swampbuster violations 1/

Year	Producers found in violation	Land in violation	Value of benefits denied
	Number	Acres	Dollars
1987	7	46	96,225
1988	59	667	828,491
1989	57	459	979,167
1990	72	395	1,369,799
1991	102	1,188	1,476,316
1992 2/	13	11	184,831
Total	310	2,766	4,934,829
	Number	Hectares	Dollars
1987	7	19	96,225
1988	59	270	828,491
1989	57	186	979,167
1990	72	160	1,369,799
1991	102	481	1,476,316
1992 2/	13	4	184,831
Total	310	1,120	4,934,829

1/ Source: ASCS. 2/ Figures for 1992 are not final.

Producers are Cited for Swampbuster Violations

The swampbuster provision entails partial or total loss of farm program benefits to farmers who convert a wetland to produce or to make possible the production of an agricultural commodity. While the 1992 figures are not yet final, ASCS reports that 310 participating producers were found in violation on a total of 2,800 acres from 1987-1992 (table 16). Total requested benefits denied amounted to more than $4.9 million. This does not include 72 additional producers found in violation and denied benefits under tobacco and peanut marketing eligibility, for which no denied dollar amount is available, nor does it include violating producers who did not request USDA benefits.

Water Quality Incentive Projects Implemented under ACP

In addition to the Wetlands Reserve Program, the 1990 FACTA also authorized another new program, the Agricultural Water Quality Protection Program. More commonly referred to as the Water Quality Incentive Program, its enrollment goal was 10 million acres during 1991-95.

Congressional appropriations directed USDA to implement a more limited program under the ongoing Agricultural Conservation Program (ACP) as Water Quality Incentive Projects (WQIP). Operation of the WQIP is similar to the program originally authorized by Congress, but has been limited to cropland within existing Water Quality Demonstration Projects, Hydrologic Unit Areas, and 1991 ACP Water Quality Projects.

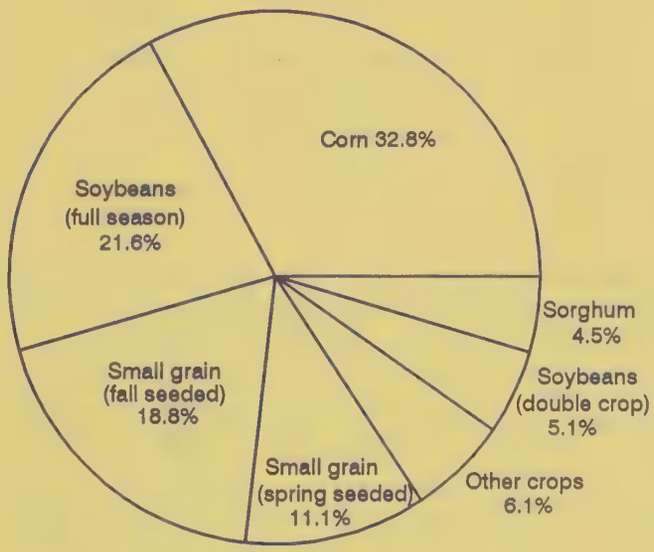
The goal of the WQIP is to reduce nonpoint source agricultural pollutants in an environmentally and economically sound manner by assisting farmers to modify management systems. The program is voluntary and provides annual incentive payments to farmers who implement water quality protection plans on their farms. The fiscal year 1992 appropriation for the WQIP was $6.75 million. For fiscal year 1993 USDA requested $10 million, $15 million was appropriated, and plans to expand to additional water quality areas are underway.

The first opportunity for farmers to participate in the WQIP was held in February. Approximately 2,133 requests were received covering more than 360,000 acres.

Farmers Use Conservation Tillage Systems on 79 Million Acres

Conservation tillage systems were applied on over 79 million acres during 1991 (table 17). Conservation tillage was used mainly on corn, soybeans, or small grain (figure 11). About one-third of the total acreage planted to corn, soybeans, and sorghum was conservation tilled. Conservation

Figure 11
Conservation Tillage Acres by Crop, 1991[1]



1/ Share of total acres planted with conservation tillage.
Source: Conservation Technology Information Center.

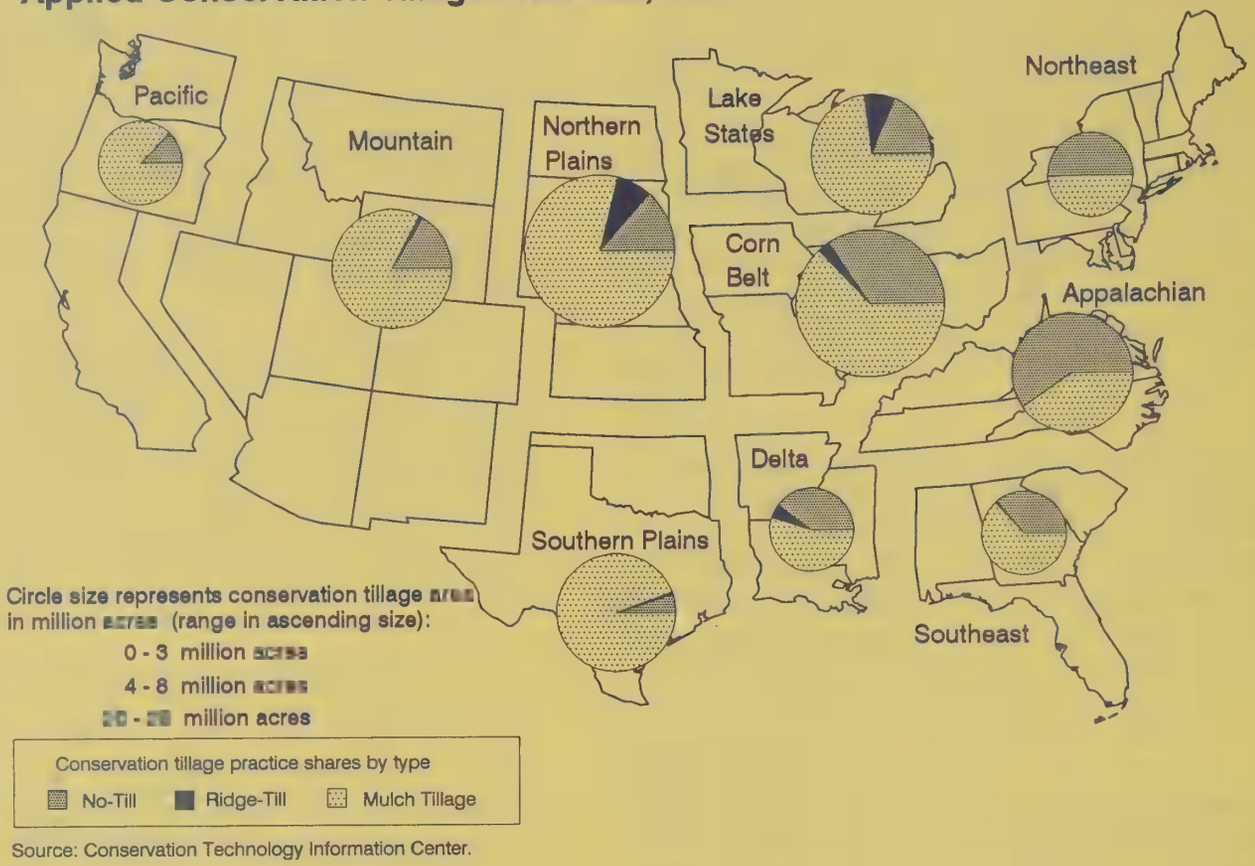
Table 17--National use of conservation tillage

Use	1983	1984	1985	1986	1987	1988	1989	1990	1991
					Million acres				
Total area planted 1/	309	345	342	327	305	308	317	319	314
Area planted with conservation tillage 2/	70	87	95	97	86	88	72 3/	73 3/	79 3/
					Million hectares				
Total area planted 1/	125	140	139	132	124	125	128	129	127
Area planted with conservation tillage 2/	28	35	38	39	35	36	29 3/	30 3/	32 3/
					Percent				
Percentage of area with									
No-till	3.3	4.1	4.4	4.4	4.1	4.2	4.4	5.3	6.6
Ridge till	0.3	0.4	0.6	0.6	0.7	0.8	0.9	1.0	1.0
Other conservation tillage 3/	19.0	20.7	22.8	24.6	23.4	23.6	17.4	16.7	17.6
Total conservation tillage	22.6	25.2	27.8	29.6	28.2	28.6	22.7	22.9	25.2

1/ Estimates of acres planted to principal crops from the National Agricultural Statistics Service, USDA. 2/ Estimates of conservation tillage use from the National Surveys of Conservation Tillage Practices from the Conservation Technology Information Center, National Association of Conservation Districts. 3/ The definition of other conservation tillage was refined in 1989 from that used in previous years.

Figure 12

Applied Conservation Tillage Practices, 1991



Source: Conservation Technology Information Center.

tillage was most frequently used with double-cropping with about 63 percent of the double-cropped soybeans, 53 percent of the double-cropped corn, and 46 percent of the double-cropped sorghum acreage produced with conservation tillage systems. (Farmers apply conservation tillage mostly on their own, only 410,000 acres were cost-shared in 1991.)

Conservation tillage refers to any system leaving 30 percent or more of the soil surface covered with previous crop residue after planting. Two key factors influencing crop residue are the previous crop, which establishes the initial residue amount and determines its fragility, and the type of tillage operations prior to and including planting.

No-till and ridge-till accounted for over 30 percent (almost 24 million acres) of the total acreage in conservation tillage nationwide. The use of these two conservation tillage systems is more important in the six eastern regions (figure 12). High residue conservation tillage systems such as no-till and ridge-till can leave as much as 70 percent of the soil surface covered with crop residues and offer more protection against erosion than other tillage systems.

The recent upward trend in the use of high residue conservation tillage systems will likely continue as farmers use conservation tillage to meet Conservation Compliance requirements, to reduce their production costs, and to capture other benefits associated with employing these tillage systems.

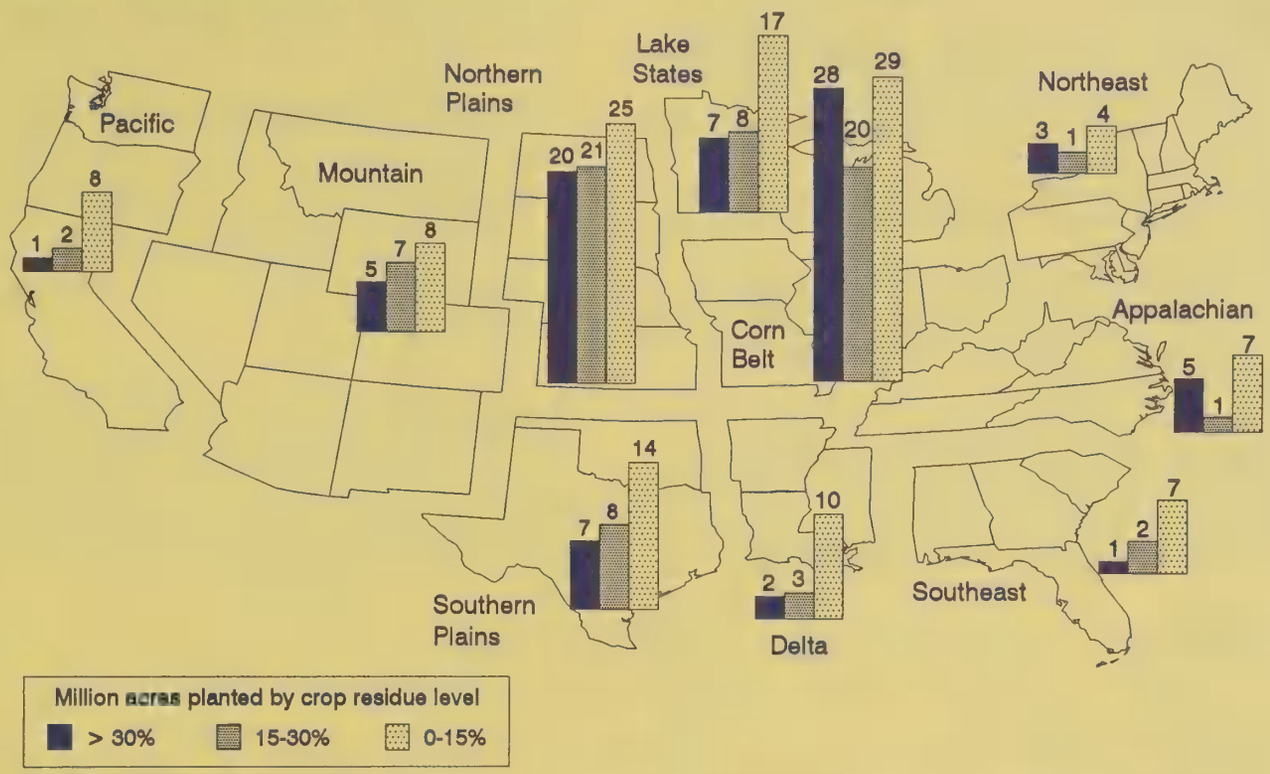
The Corn Belt and the Northern Plains had the largest acreage of conservation tillage (figure 13). These regions plus the Lake States accounted for 70 percent of total conservation tilled acres in 1991.

Conservation tillage reduces soil erosion and water runoff while increasing infiltration. Conservation tillage decreases the amount of agricultural chemicals that reach surface water through being attached to sediment or dissolved in the runoff. Increased infiltration improves soil moisture but, on the other hand, raises concerns about the potential for dissolved chemicals to leach into shallow ground water. Recent research results indicate that under normal climatic conditions conservation tillage is no more likely to degrade ground water than other tillage systems.

While new or retro-fitted machinery may be required to adopt conservation tillage, fewer trips over the field and reduced labor requirements result in immediate cost savings. If energy prices increase, conservation tillage becomes more profitable because less fuel is consumed with fewer trips over the field. Machinery costs usually decline in the long run because a smaller machinery complement is needed. However, conservation tillage systems might require manage-

Figure 13

Crop Residue Levels on Planted Acreage by Region, 1991



Source: Conservation Technology Information Center.

Table 18--Estimated average annual erosion prevented by USDA programs, 1986-91

Treatment category and program	1986	1987	1988	1989	1990	1991
				Million tons		
Erosion prevented on lands newly treated under:						
Conservation Reserve Program (CRP)	57	304	153	86	46	8
Agricultural Conservation Program	30	28	40	34	33	34
CTA and other SCS programs 1/	167	153	174	178	178	248
Annual Acreage Reduction Program 2/	92	120	107	62	56	60
Total of above	346	605	474	360	313	350
Erosion prevented by practices on land previously treated under:						
CRP	NA	57	361	514	600	646
Total erosion prevented on:						
Treated lands with available data 3/	346	662	835	874	913	996
CRP only	57	361	514	600	646	654

NA = Not available

1/ Conservation Technical Assistance and other Soil Conservation Service apart from that under CRP and ACP. Includes soil loss reduction occurring as farmers bring HEL under conservation compliance but only when a resource management system is applied. 2/ Assumes an average soil erosion reduction of 2 tons/acre/year because of idling the land and less cultivation. 3/ Includes CRP and the erosion prevented on land newly treated under other programs.

ment changes related to proper timing and placement of fertilizers and pesticides and in carrying out tillage operations.

Conservation Achievements

Erosion Reduced by USDA Programs Approaches 1 Billion Tons Annually

Although accounting is not complete, USDA conservation programs appear now to be reducing erosion on agricultural lands by about 1 billion tons annually (table 18). Of the accounted for reduction, two-thirds is due to the accumulated effects of the CRP. The biggest annual reductions in erosion occurred in 1987 and 1988 when large numbers of cropland acres went out of production and under protective cover in the CRP. Results of the 1992 National Resources Inventory, a statistical sample of U.S. land, should document a substantial reduction in erosion when compared to the 1987 inventory.

Not fully reflected in the numbers yet is the erosion reduction that will occur as farmers of highly erodible lands continue to implement residue management and other practices to comply with the Food Security Act requirements. By 1995, when all HEL lands have to be in compliance for the farmer to maintain eligibility for USDA program benefits, the erosion reduction from conservation programs could exceed 1 billion tons annually.

Assistance to Farmers Helps Reduce Chemical Use

Besides reducing soil erosion and sediment discharge to streams and other water bodies, USDA programs are helping farmers in selected critical areas reduce farm chemical use through better management.

USDA is helping farmers adopt farming practices that protect water quality through USDA's Water Quality Program Plan in support of the Presidents Water Quality Initiative. To date, the following projects have been established:

- Five Midwest Systems Evaluation Area (MSEA) projects
- Sixteen demonstration projects
- Seventy-four hydrologic unit area projects
- Fifty-nine USDA/ARS research projects
- Ninety Cooperative State Research Service cooperative research projects

In addition, 71 water quality special projects have been established by ASCS as part of the ACP program. Data indicate that the 16 demonstration projects and 74 hydrologic unit projects, although only established in 1990 and 1991, are beginning to show some intermediate results. With the ultimate objective of improving water quality, these projects in

Table 19--Agricultural Conservation Program by primary purpose, 1985-91

Purpose	Unit	Year						
		1985	1986	1987	1988	1989	1990	1991
Erosion Control (English units)								
Cost-shares paid 1/	Mil $	126.4	93.5	92.4	133.8	114.3	112.3	111.5
Reduced erosion: per acre	Ton/ac/yr	5.7	5.8	6.4	5.9	5.5	5.5	5.8
Total	Mil tons/yr	40.6	29.5	28.3	39.9	34.3	33.3	34.0
Cost-share per ton of reduced erosion 1/	$/ton	0.60	0.60	0.60	0.59	0.61	0.60	0.58
Erosion Control (Metric units)								
Reduced erosion: per HA.	MT/HA/yr	12.8	13	14.3	13.2	12.3	12.3	13.0
Total	Mil MT/yr	41.3	30	28.8	40.54	34.9	33.8	30.8
Cost-share per ton of reduced erosion 1/	$/MT	0.61	0.61	0.61	0.6	0.62	0.61	0.64
Water Conservation (English units)								
Cost-shares paid	Mil $	20.9	15.1	15.1	27.7	25.8	24.7	23.6
Water conserved: per acre	Ac-ft/yr	1.0	0.9	1.0	1.2	1.0	1.1	1.1
Total	1000 Ac-ft/yr	823.5	446.1	422.1	742.0	644.1	653.0	683.0
Cost-share per ac-ft of water conserved 1/	$/Ac-ft	2.57	3.41	3.69	3.88	4.15	3.89	3.55
Water Conservation (Metric units)								
Water conserved: per HA.	M/HA/yr	0.12	0.11	0.12	0.15	0.12	0.14	0.15
Total	1000 M/yr	101.6	55	52.1	91.6	79.5	80.60	80.58
Cost-share per ac-ft of water conserved 1/	$/M/HA	20.83	27.63	29.9	31.44	33.63	31.52	29.29
Water Quality								
Cost-shares paid	Mil $	10.2	9.3	9.5	13.4	15.9	22.4	30.5
				Percent of total cost-shares				
Sediment		13.5	14.4	13.8	12.7	13.3	15.4	16.0
Animal waste management		49.1	47.1	42.8	51.1	50.2	61.5	60.4
Fertilizer		8.6	8.5	12.9	10.4	12.5	12.4	15.7
Toxics		1.7	0.8	1.7	2.8	2.5	1.4	1.9
Salinity		26.0	27.8	25.3	17.8	16.6	5.5	2.5
Other		1.1	1.5	3.5	5.1	5.0	3.8	3.5
Wood Production and Other								
Cost-shares paid	Mil $	10.4	8.9	10.0	13.1	12.8	14.1	15.2
				Percent of total cost-shares				
Wood production		50.2	65.0	57.5	69.1	72.2	70.4	71.9
Wildlife		7.4	8.2	6.0	10.2	7.8	9.4	9.8
Energy		13.3	8.2	5.2	6.6	4.8	7.6	7.7
Groundwater pollution abatement		0.2	0.4	3.0	2.4	1.4	2.0	2.5
Groundwater recharge		0.0	0.0	0.2	0.1	0.1	0.1	0.2
Other		28.9	18.2	28.1	11.7	13.7	10.5	7.9
Total Cost-shares Paid	Mil $	167.9	126.7	127.0	188.0	168.8	173.4	180.8

1/ Amortized
Source: Agricultural Stabilization and Conservation Service

total have so far helped 10,000 producers apply water quality practices on over one-half million acres. These practices have reduced annual nitrogen applications by 2.7 million pounds, phosphorus by 1.7 million pounds, and pesticide applications by 239,000 pounds.

Under the National Estuary Program in cooperation with EPA and NOAA, USDA education and technical assistance to farmers has helped reduce annual nitrogen use by 3.6 million pounds and phosphorus by 4.0 million pounds in the Chesapeake Bay watershed. In the Great Lakes areas annual phosphorus discharge has been reduced by 3.5 million pounds.

The integrated crop management practice under the ACP program in 1991 provided over 1,000 participants with financial assistance for improved nutrient and pesticide management on about 200,000 acres. Statistics for the first year indicate a general reduction in application of nitrogen fertilizers.

USDA and EPA are cooperating to implement the Farm*A*Syst program nationally which helps farmers appraise their operations for ways to prevent chemical contamination of ground and surface water. So far the program is underway in 44 states. Results are not yet available.

About One-Sixth of ACP Funds Go to Water Quality

USDA's longstanding program of financial assistance to farmers for implementing conservation measures, directed 17 percent of its 1991 funds to project areas and practices whose primary purpose was water quality improvement (table 19). This compares to 7 percent five years earlier. Redirection of priorities within the program have almost all gone to water quality measures. Benefiting in particular have been the water quality Special Projects, the HUA projects, the demonstration projects, and the new Water Quality Incentives Program, all of which receive cost-share funds through ACP. Funds directed primarily for erosion control also contributed to water quality improvement.

Table 20--Area treated or served by cost-shared practices, 1981, 1987-1991

Practice and program	1981	1987	1988	1989	1990	1991	1981	1987	1988	1989	1990	1991
	----Million acres treated----						----Million hectares treated----					
Permanent grass cover:												
Agricultural Conservation Program (ACP)	2.78	1.54	2.02	1.78	1.54	1.61	1.13	0.62	0.82	0.72	0.62	0.65
Conservation Reserve Program (CRP) 1/		11.69	7.36	4.27	3.02	0.33		4.73	2.98	1.73	1.22	0.13
Tree planting:												
ACP	0.13	0.15	0.20	0.17	0.17	0.18	0.05	0.06	0.08	0.07	0.07	0.07
CRP		0.73	0.50	0.44	0.24	0.09		0.30	0.20	0.18	0.10	0.04
Cropland protective cover:												
ACP	1.50	0.60	0.75	0.64	0.58	0.61	0.61	0.24	0.30	0.26	0.23	0.25
Conservation tillage:												
ACP	0.72	0.42	0.45	0.33	0.43	0.41	0.29	0.17	0.18	0.13	0.06	0.17
Strip cropping systems:												
ACP	0.12	0.08	0.14	0.12	0.15	0.12	0.05	0.03	0.06	0.05	0.06	0.05
Other Practices	0.06	0.14	0.10	0.11	0.13	0.51	0.02	0.06	0.04	0.04	0.05	0.01
Total area treated 2/:												
ACP	5.31	2.93	3.66	3.15	3.00	3.44	2.15	1.19	1.48	1.27	1.22	1.39
CRP		13.67	8.76	5.35	4.10	0.48		5.54	3.55	2.17	1.66	0.19
Total area treated	5.31	16.60	12.42	8.50	7.38	4.32	2.15	6.72	5.03	3.44	2.99	1.75
	----Million acres served----						----Million hectares served----					
Grazing land protection (ACP)	3.44	1.74	3.60	3.77	4.72	3.34	1.40	0.70	1.46	1.53	1.91	1.39
Irrigation water cons. (ACP)	0.90	0.49	0.82	0.77	0.69	0.77	0.36	0.20	0.33	0.31	0.28	0.31
Terraces and diversions (ACP)	0.58	0.64	1.07	0.93	0.62	0.70	0.23	0.26	0.43	0.38	0.25	0.28
Water impoundments (ACP)	0.79	0.20	0.27	0.27	0.22	0.19	0.32	0.08	0.11	0.11	0.09	0.08
Sediment control struc. (ACP)	0.42	0.17	0.25	0.22	0.21	0.22	0.17	0.07	0.10	0.09	0.08	0.09
Sod waterways (ACP)	0.73	0.13	0.22	0.17	0.18	0.26	0.30	0.05	0.09	0.07	0.07	0.11
Other practices (ACP)	0.43	0.18	0.25	0.27	0.31	0.31	0.17	0.07	0.10	0.11	0.13	0.13
Total area served	7.29	3.55	6.48	6.40	6.95	5.79	2.95	1.44	2.62	2.59	2.81	2.34
Total area cost-shared	12.60	20.15	18.90	14.90	14.33	10.11	5.10	8.16	7.65	6.03	5.80	4.09

1/ The CRP began in 1986. There were no new signups in 1990. 2/ Includes some practices not listed. CRP numbers are the acres enrolled.

Source: Agricultural Stabilization and Conservation Service.

Of the water-quality directed financial assistance, 60 percent went into animal waste management, and 16 percent each into fertilizer (nutrient) management and sediment control. Funding for animal waste and fertilizer management has been increasing while that for salinity control has been dropping. In terms of area treated or served, the most implemented practice under ACP in general has been grazing land protection, followed by permanent vegetative cover establishment or improvement (table 20). The latter becomes the most cost-shared practice overall, however, when added to that implemented under the CRP.

The Experimental Rural Clean Water Program Nearing Completion

The experimental Rural Clean Water Program (RCWP) was funded in 1980 and 1981 to "Achieve improved water quality in the approved project areas in the most cost effective manner possible." Now ending its 10 year contracting period, the program has provided USDA agencies valuable experience in planning, implementing, and monitoring and evaluating a water quality program. The best management practices under the program reduced pollutants leaving the farms and sites treated. Improvements in water quality in impaired water bodies occurred, but proved more elusive and difficult to document than anticipated. One insight gained from RCWP for improving the economic efficiency of water quality programs is to initially evaluate potential benefits and costs of proposed projects as an aid to project selection. Another is to place greater emphasis when possible on implementing lower cost management systems instead of structural practices to reduce pollutants. The program will be the subject of a major conference in September 1992 which will further bring out the successes, insights, and lessons learned to aid other USDA water quality programs.

Great Plains Conservation Program Expands

In 1991, 38 more counties in 10 eligible states were covered under the Great Plains Conservation Program, bringing the total to 556. About 150 million acres have been treated under the program since 1956. The program emphasizes reducing soil erosion caused by wind by treating highly erodible cropland, converting cropland back to grassland, reseeding depleted rangeland, and planting trees for windbreaks. The program also offers assistance in improving recreation resources, controlling agriculture-related pollution, and promoting economic uses of the land. The ten states covered in the program are Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, and Wyoming.

National Water Quality Inventory

The Environmental Protection Agency's 1990 Report to Congress summarizes state assessments on rivers, lakes, estuaries, and coastlines. The inventory covers 36 percent of U.S. river miles, 94 percent of the Great Lakes' shore miles, 47 percent of other lakes acres, 75 percent of estuary square miles, and 22 percent of ocean coastlines. These inventories show persistent water quality problems that impair designated beneficial uses.

Of the inventoried river miles, 7 percent have threatened uses and 30 percent have impaired uses. The principal pollutants are silt, nutrients, oxygen demanding materials, and pathogens. Sixteen percent of the lake acres, excluding the Great Lakes, were designated as threatened and 40 percent impaired by metals, nutrients, organics, suspended solids, and other pollutants. Agriculture is reported as a major or minor contributor of pollutants to 60 percent of the impaired river miles and 57 percent of the lake acres, excluding the Great Lakes.

Ninety-seven percent of the Great Lakes' shore line was designated as impaired and the dominate pollutants were organics, pesticides, and metals. Agriculture is reported as a contributor of pollutants to 6 percent of the shore lines. About 11 percent of the inventoried estuaries were threatened and an additional one-third impaired by pollutants. Only 10 percent of the coastal miles were impaired and another 1 percent threatened by pollutants. Agriculture was identified as contributing pollutants to 18 percent of the impaired estuaries and 26 percent of the impaired coast lines.

Non-USDA Water Quality Programs Affecting Agriculture

● **1987 Water Quality Act Section 319 Programs:**

Section 319 of the Act requires states and territories to file assessment reports with the EPA identifying navigable waters where water quality standards cannot be attained without reducing nonpoint source pollution. States are also required to file management plans with EPA identifying steps that will be taken to reduce nonpoint source pollution. All states have now filed assessment reports and management plans and have approved programs. The Act authorizes up to $400 million for implementing these plans; $52 million was awarded in fiscal year 1992.

● **1987 Water Quality Act National Estuary Program:**

Section 320 of the 1987 Water Quality Act provides for identification of nationally significant estuaries threatened by pollution, preparation of conservation and management plans, and for Federal grants to state, interstate, and region water pollution control agencies for purposes of preparing the plans.

● **Pesticide Programs:**

The Federal Insecticide, Fungicide, and Rodenticide Act of 1947 (FIFRA) provides the legal basis under which pesticides are regulated. The reregistration process of FIFRA (which requires EPA to approve the active ingredients used in agricultural insecticides and herbicides) could enhance ground water protection by controlling the use of highly leachable chemicals

● **.Safe Drinking Water Act:**

The Safe Drinking Water Act (SDWA) requires the EPA to publish drinking water standards (MCL's) for any contaminants which can have adverse health effects in public water systems (serving over 25 persons or with 15 connections). Standards established by EPA under the SDWA are being used as guidelines for assessing contamination of ground water supplies in private wells as well. The EPA also sets non-regulatory health advisories on contaminants for which MCL's have not been established. The SDWA also established a wellhead protection program to protect sole-source aquifers from contamination by pesticides and agricultural chemicals.

● **Coastal Zone Management Act:**

The goal of the Coastal Zone Act Reauthorization Amendments of 1990 is "to restore and protect coastal waters." States with a federally approved coastal zone management program are also required to develop a Coastal Nonpoint Source Pollution Control Program and submit it to the Environmental Protection Agency and National Oceanic and Atmospheric Administration.

Tables

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